ANNALS OF OPHTHALMOLOGY AND OTOLOGY

JANUARY, 1895.

CORNEAL OPACITIES. CLINICAL STUDY OF CASES TREATED BY DIFFERENT METHODS.

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THE cases reported in this paper are not to show the superiority of any one method of treatment. They are typical ones, and illustrate different methods of treating such cases, the results obtained, and the length of time taken to get these results. Fuch, in his text-book, refers to Adler as recommending electricity for the removal of corneal opacities. The method used by him is to place two small metallic buttons, one of which is attached to the positive, and the other to the negative pole of a battery. This is spoken of as a very severe measure, attended with a great deal of pain.

The method used in the treatment of the cases reported here, is one devised by Dr. Alleman, and reported by him in the *Brooklyn Medical Journal*. A small silver electrode, with concave contact surface, in which a globule of mercury is made to adhere (this for a surer contact rather than any medical virtue), is attached to negative pole; the ordinary sponge electrode to temple is positive. The strength of current used is $^1/_4$ to $^1/_2$ milliampere; the time of contact one minute, rarely longer.

Pressure inunction is the name given to a method of treatment advised by Dr. Ryerson, of Toronto, and reported by him in a paper published in *Archives Ophthal.*, vol. XX.

The first case reported, is one treated with electricity alone; opacities of recent development.

The second, treated first with pressure inunctions and yellow oxid of mercury ointment, then with electricity; opacities present a year.

The third, treated with yellow oxid of mercury ointment, then with electricity; opacities of thirty years standing.

The fourth, treated with pressure inunctions alone; opacities—some of them recent, and some of long standing.

The fifth, treated with yellow oxid of mercury ointment alone; opacities of several months' duration.

The first case I shall report rather fully, as the history prior to corneal opacities is an interesting one:

Case I. Mr. L. H., 30 years of age, occupation, book-keeper. Was first seen on October 29, 1887. History of granular ophthalmia when a child. Palpebral conjunctiva scarred, and shows characteristic appearance left by old tracomatous inflammation; no sign of present trachoma. The cornea slightly hazy; vision, R. E., $\frac{5}{20}$; L. E., $\frac{5}{30}$. Iris normal; lens and vitreous clear; optic nerve, retina and choroid normal. Dacryocystitis present in right, and partial occlusion of left lachrymal duct. The strictures were divided; dacryocystitis treated. Glasses were given: R. E., cyl. — 1 ax. 170° = $\frac{5}{6}$; L. E., cyl. — 2 ax. 40° = $\frac{5}{6}$. Patient reported occasionally for treatment of lachrymal trouble, until September 20, 1891. At this date he presented himself with right eye very much inflamed and painful; general health poor. There was found at upper and outer margin of cornea a narrow linear ulceration; L. E. normal. The ulceration was curetted and touched with carbolic acid and dressed antiseptically. General treatment given. There was no noticeable discharge from lachrymal sac. This was, however, thoroughly washed out with solution of bichlorid during the whole period of trouble. The following day the ulceration had extended very perceptibly. The floor and walls of the ulceration were cauterized with galvano-cautery, but in spite of repeated cauterization the destructive process crept around entire cornea (annular ulcer). The island of clear cornea then began to grow hazy and show signs of sloughing. This entire area of diseased tissue was thoroughly cauterized. This put a stop to the destructive process, new tissue beginning to fill in. The same ulcerative condition now began in the left eye, the ulcerative process creeping along the margin of the cornea for about half its circumference. The use of cautery in this eye checked its further progress. The ulcerative condition extended from below, well up towards pupillary area. After healing process was complete in both eyes, a thick central opacity, extending well on to margin of cornea, was noticeable on right eye. Vision = count fingers. Vision, L. E., = $\frac{4}{60}$. The use of electricity was now commenced. Cornea anesthetized with cocain; current of ¼ M. A. used for one minute every other day, and then every day. Vision on February 12, 1892, = $\frac{6}{20}$ each eye. Electricity was applied at intervals until July 25, 1892. The ophthalmometer at this date showed a corneal astigmatism of .6 D. ax 90° in right eye, and 3 D. ax. 90° in left eye. The eyes were then tested for glasses, and lenses prescribed as follows; R. E., cyl. — 4.50, ax. 180° = $\frac{6}{15}$. L. E., sph. — 1.75 ⊂ cyl. — 3, ax. 130° = $\frac{6}{15}$; near vision reads Jag. No. 2 at 30 cm. The gentleman was able to return to his duties as book-keeper.

The increase in corneal astigmatism and the change in axis is interesting.

Case II. Mrs. W., 26 years of age. First seen on November 6, 1893. Had recently come to this country from England where she had been under

treatment for interstitial keratitis. Inherited syphilitic taint; vision, R. E. = $\frac{1}{60}$ by turning head to one side. L. E., amblyopic, = light perception; eye strongly divergent. This had been present since childhood. Pupils dilated well under mydriatic. Patient sent to hospital. Pressure inunctions and the ointment of yellow oxid of mercury used in eyes once a day, the nurse performing thorough massage of cornea through closed eyelid. This treatment continued for three weeks. Vision, R. E., = $\frac{2}{60}$. Treatment by electricity was now commenced; ½ M. A. for one minute; clearing of cornea quite rapid; treatment only possible at intervals of a week or more, as patient left hospital. Vision, April 18, 1894, = $\frac{6}{20}$.

Case III. Mr. John C., 36 years of age. Seen first on March 14, 1894. History of inflammation of eyes in childhood. Central leucoma, right eye; vision, R. E., = $\frac{5}{60}$; L. E., = count fingers. The lens, vitreous, nerve, and retina, normal in right eye. The left has lenticula opacity. Ung. hydrarg. oxid flav. prescribed; to be used once a day. This treatment continued for three months; vision, R. E., = $\frac{6}{60}$. Treatment continued until July, 1894, vision = $\frac{6}{22}$. Electricity now used, ½ M. A. one minute every other day. October 7, 1894, vision = $\frac{6}{60}$; no perceptible improvement; in fact, a decided loss of vision during treatment by electricity.

Case IV. Miss Miriam K., 23 years of age. First seen on November 1, 1893. Suffering with kerato-iritis. Family history poor. Has had repeated attacks of inflammation of eyes. When seen by me there was profuse lachrymation, and photophobia; cornea hazy and infiltrated; iritis, numerous posterior synechia. Patient sent to hospital; hot applications, constitutional treatment, atropin, ordered. The anterior chamber of right eye very deep; tension inclined to be plus; paracentesis of chamber performed; pain relieved. Subconjunctival injection of solution bichlorid mercury. Injections every fourth day. Inflammation rapidly disappeared. Vision, R. E., December 9, 1893, = $\frac{5}{60}$. Sees objects with left eye. Pressure inunctions used. (The following formula is the one used by Dr. Ryerson: Calomel, gr. iii Ung. lanolin and vaselin, ot each four drachms mix. Small piece put in conjunctival sac, and large quantity smeared over closed eyelids; gauze and absorbent cotton compress and fairly tight bandage over all; allowed to remain one hour twice a day.) This treatment continued until January 2, 1894, when she was discharged from hospital with vision in R. E. of $\frac{6}{22}$; L. E., $\frac{5}{60}$. The ophthalmometer showed a corneal astigmatism of 3 D. ax. 75°, R. E.; 3 D. ax. 105°, L. E. Glasses were prescribed which gave vision as follows: R. E., cyl. + 2.25, ax. 120° = $\frac{6}{12}$; L. E., sph. + 1.50 ⊖ cyl. + 2.50, ax. 120° = $\frac{6}{12}$. Patient directed to continue pressure inunctions. Returned on August 18, 1894; corneal astigmatism as shown by ophthalmometer, R. E., 1 D. ax. 15°; L. E., 5 D. ax. 120°, a decided lessening in corneal astigmatism; very little to be seen of corneal opacities. Glasses given as follows: R. E., cyl. + 1, ax. 10° = $\frac{6}{6}$; L. E., cyl. + 5.50, ax. 160° = $\frac{6}{6}$. The change in corneal astigmatism as the cornea cleared is interesting.

Case V. Master S. S., 3 years of age. First seen in 1888; brought to office by family physician. General health good; intense photophobia present; ulceration of left cornea at upper and outer quadrant found. This was treated in the usual way. When healing process was complete a thick cicatrix extended down on to pupillary area. The family physician was

instructed to have the yellow oxid of mercury ointment used. I was afterwards informed that the parents, being unable to manage the child, brought him to the physician's office nearly every day for a period of nearly three years, where the ointment was thoroughly applied. Child brought to me again on October 12, 1894. The corneal opacity had all disappeared from pupillary area, small white leucoma at site of old ulceration; vision, R. E., $= \frac{6}{6}$; L. E., $= \frac{6}{15}$. Ophthalmometer showed corneal astigmatism of 1.50, ax. 90°, R. E.; 3 D., ax. 15°, L. E. Child complained of headache and pain in eyes; unable to see clearly, particularly at school. Eyes put under the influence of atropin. Glasses were prescribed as follows: R. E., cyl. + 75, ax. 90° $= \frac{6}{6}$; L. E., cyl. + 2, ax. 180° $= \frac{6}{6}$.

Where improvement is found from the use of electricity, does this improvement come from a real electrolysis of the opaque tissue, or from the direct irritation of the cornea caused by the stimulus of the current directly applied? I am inclined to think the last explanation the true one. I am quite sure there is some electrolytic action, but do not think it has any action in clearing the tissue. The electrolysis is noticeable on surface of clear cornea if the current is too strong, or if the electrode is allowed to remain too long in one spot. There is then a distinct break in superficial corneal layer. The vision in case III was decidedly worse after using electricity. This might be explained by electrolytic action of current on superficial layers of cornea which, when it was reformed, might be somewhat hazy. The treatment by this method seems to be adapted to all varieties of corneal opacity, though it is not equally successful in its results with all, any more than any other one form of treatment. The method by pressure inunction would seem best adapted to opacities produced by inflammatory deposit, interstitial and superficial keratitis. There is no one method of treatment that is applicable to all cases. The best results in the majority of cases are obtained from the judicious varying of methods. The cornea, in time, it would seem, becomes tolerant to different irritants. In most recent cases it is best to commence with the milder forms of treatment, as the pressure inunctions, then yellow oxid of mercury, or combining the pressure inunctions with the oxid first, and then electricity. The last has the advantage of its being possible to accurately control it.

SOME REMARKS ON SKIASCOPY OR THE SHADOW TEST.

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THE many names given to this method of refraction has had much to do, no doubt with keeping skiascopy in the back ground of ophthalmology, instead of giving it the prominence which it more justly deserves.

Nettleship, Noyes and others would criticise skiascopy, because "we see nothing and think nothing of the condition of the fundus." This criticism being based apparently on the name (retinoscopy) rather than from any great amount of practical experience with the method.

Skiascopy (also scioscopy) Greek skia = shadow, and skopia = view, literally, "viewing the shadow" appears to be the best name, though not "*per se*" correct, as it is not a shadow that is seen, but a small illuminated area with surrounding darkness, more or less intense. (See Figs. A, B).

While admitting that the ophthalmoscope in front of a well trained eye can often make a close refractive record, yet only to the few does such skill obtain, and even then there is that uncertainty, which does not attach itself to the skiascope in competent hands.

With an eye, otherwise normal except for its optical correction, and being under the influence of a reliable mydriatic, there is no more accurate method of obtaining its exact correction, than by the shadow-test. The shadow-test is to the refractive media of the eye what the ophthalmometer of Javal is to the cornea. The skiascope: Two forms of plane mirror are in use. A. The large mirror, four centimeters in diameter, with sight hole four or five millimeters in diameter, often cut through the glass.

B. The small mirror,[1] two centimeters in diameter, (on a four centimeter metal disc) with sight hole not cut through the glass, the quicksilver or plating alone being removed. The glass at the

[1] Philadelphia *Polyclinic* for November, 1893: "A modified skiascope by Dr. J. Thorington."

sight hole giving additional reflecting surface. (Figs. 1 and 2).

The large mirror is of use when refracting at a greater distance than one meter, and the small mirror by doing away with the super-abundance of light as produced by the large instrument is as small a reflecting surface as can be used to advantage at one meter distance. Reference to Fig. 1 shows this mirror full size, with reflection of central light area over the sight hole, as it comes from the opening in cover-chimney and as seen by the patient.

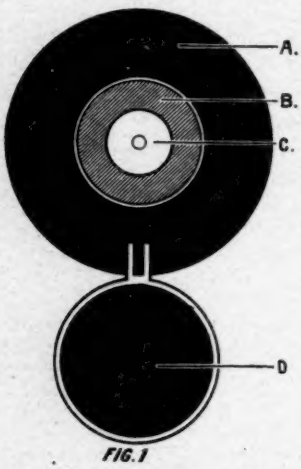


FIG. 1

Showing central light area C on small mirror B. A—Metal disc. D—Folding cap handle to protect B when not in use.

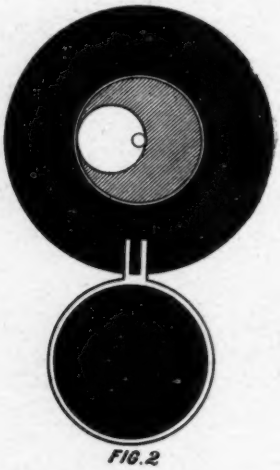


FIG. 2

Showing central light area passed to its limit for purposes of examination.

It is only while the sight hole is in this light area that the observer can get a good reflex from the eye under examination. Fig. 2 shows the mirror with light area passed to its limit for purposes of examination; if beyond this point, the observer loses the light reflex, thus showing the advantage of the small mirror, and also the necessity for a very restricted movement and not the vigorous one so many give it. (See XI b, page 10.)

The cover chimney, as suggested by Jackson is made of metal (sheet iron), and to fit easily over the glass chimney of the Argand burner, dimensions, nineteen centimeters high, and in circumference, with round opening, twelve millimeters in diameter, six centimeters from lower edge.

As an improvement over this I have had made by Messrs Reimold & Meister of this city, an asbestos chimney of same dimensions;

claiming two advantages. 1. A draft of air may strike the asbestos with impunity, as it does not chill and cause a break of the inner glass chimney, the broken glass cutting the mantle of the Welsbach, as has happened repeatedly with the writer in the use of the metal chimney, thus putting an end to further examinations until repairs were made. 2. The lower part of the asbestos does not get so warm, but that it may be removed without burning the fingers, if it is desired to use the same light for purposes other than skiascopy.

Having used the skiascope almost daily for the past two years at both the Philadelphia polyclinic and Wills' Eye Hospital, and in his own private work with the utmost satisfaction, the writer would offer the following suggestions to those who may experience some of the difficulties that are constantly seen confronting students in

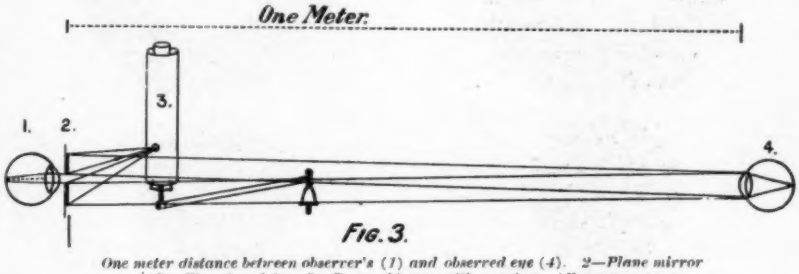


FIG. 3.

One meter distance between observer's (1) and observed eye (4). 2—Plane mirror (See Figs. 1 and 2). 3—Corer-chimney with opening. (For purposes of drawing, light has been placed above level of eyes).

acquiring this method of refraction, and as accuracy depends on a careful attention to details, these hints may not be untimely.

Of the two methods of skiascopy:

First, with the large concave mirror and source of light above patient's head, and

Second, with small plane mirror and source of light from a twelve millimeter opening in a cover-chimney, close to observer's eye; obtaining point of reversal at one meter; the latter is the method referred to in the following remarks:

I. The room should be darkened, the darker the better, and all sources of light, except the one in use, excluded. (See No. VI, page 8).

II. The patient to be seated comfortably in front of the observer at one meter distance[2] and have his eyes on as near a straight line with the opening in cover-chimney and mirror as possible. (Fig. 3).

[2] Shadow-test by Jackson, *vide* De Sweinitz, Diseases of the Eye.

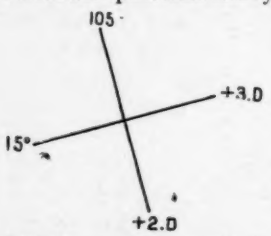
III. The light[3] must be steady, clear and white, the Welsbach possessing all these qualities. The Argand burner is good, but care must be taken not to have the flame too high, or a blue light will occupy the opening in cover-chimney, and a dim reflection from mirror be the result.

IV. The source of light to be five or six inches to the left and front of the observer, the rays from opening in chimney falling on the mirrors in front of the observer's right eye, the left eye being in darkness and away from any of the light rays. This will save the observer great annoyance.

V. The trial frame is to be comfortably and accurately adjusted. The temples to rest easily on the ears. The nose piece (bridge) to be of sufficient length to permit the eye pieces to fit accurately over any pair of eyes (especially in children), and have the cornea occupy the center of the eye-piece. Correct results cannot be expected, unless the correcting lenses be placed with their centers corresponding to corneal centers and at the same time perpendicular to the front of the eye.

VI. Annoying reflexes, catoptric images, etc., are the result of poorly placed frames or lenses, turning of patient's head, other sources of light, etc. (See No. I).

VII. Neutralizing lenses, some use sphericals alone, while others use sphericals and cylinders, when the latter are called for by the presence of astigmatism. Advantage being claimed for both methods. With the following: At one meter the 105° meridian is corrected by a + 2 D., a + 3 D. correcting the 15° meridian, the difference in strength of the two sphericals giving the strength of the cylinder, in this instance a + 1 cylinder. This method of correcting with sphericals has been found much more satisfactory than by placing the + 2 D. as called for above, and then adding and changing cylinders until the correct one is found, and each time taking care to get the cylinder axis just right, which is so difficult in the dark room. During this examination the patient is to gaze at the observer's forehead just above his eye; in this way the patient avoids the strain of looking straight at the bright reflected light, and at the same time the macular region is refracted. It is customary to cover the patient's other eye, and thus keep it at rest as much as possible.



[3] Electric light with ground glass covering is meeting with favor.

VIII. The central shadow, the stumbling block to so many, and on the recognition of which so much depends, is best demonstrated in a dark room by reflecting rays through a strong plus lens (13 D.) and observing the focal point on a light surface; it is this focal point which corresponds to and is the central shadow as seen in looking into the center of the pupil, as the correcting lens approaches the exact refraction, the mirror being moved even so slightly. (See Figs. A and B).

A. Central shadow. B. Central shadow to one side by tilting mirror. C. Band of light, astigmatism, axis 75 degrees. D. Scissor-movement and small central shadow.

IX. The band of light is an elongation of the central shadow; Fig. C., and is also shown in dark room by reflecting rays through a high plus cylinder (+ 6 D. cyl.), onto a white surface. This light band is only present in astigmatic eyes, and always gives the axis for the cylinders, and hence, is the meridian of least ametropia. In eyes with mixed astigmatism there are two bands of light, each seen separately at opposite axes, the one moving with, and the other against the movement of the light on the face.

X. The scissor-movement is not infrequent, and is generally seen on the horizontal meridian, or within a few degrees of 180°. When present it will be recognized by two narrow bands of light approaching each other from above and below, toward the center of the pupil, Fig. D. The movement of these bands has been likened to the opening and closing of a pair of scissors, and hence the name. Accompanying this movement, and in the shaded interspace between the bands, is often seen the small central shadow. While the double band of light (scissor-movement) is not on the meridian of least ametropia, yet it is in these cases that we continue to use the meridian of the bands as the axis for our cylinder, namely with the following formula: + 1.50 D. ⊂ + 0.50 cyl. ax. 90°, substitute a spherical the strength of the combined values of the spherical and cylinder, and use a minus cylinder of same number as the plus at the opposite axis, the result would be + 2 D. ⊂ — 0.50 cyl. ax. 180°; the vision with this latter formula is much better in many instances than with the former. Either of these prescriptions would be correct, but the latter + 2 D. ⊂ — 0.50 cyl. horizontal is practically the better of the two, and should be ordered when so found. Cases of scissor-movement, that the writer

has had opportunity to examine, the ophthalmometer of Javal has failed to note any corneal error, thus giving the supposition that the astigmatism must be lenticular. If this be the correct solution of the scissor-movement, then surely it is in these casés that the shadow-test stands supreme and excels both the ophthalmometer and ophthalmoscope: the former not being able to find the astigmatism, and the latter, while detecting, cannot locate it.

XI. Movement of the mirror. There are times when a quick or rapid movement, and at other times a slow or gradual movement is required; a substitution of one for the other, a quick when a slow movement should be made and "*vice versa*," the result cannot be correct.

(*a*). The quick movement is generally necessary when looking into an eye before any correcting lens has been placed "*in situ*." It tells the character of the refraction.

(*b*). The slow movement comes into use when the eye has been corrected to within the 0.75 of a diopter or less, and it is generally at this point that so many stop and believe they have gotten as near to the result as the mirror can bring them. With a simple hyperopia of + 1.50 D. (or + 2 .50 D. in dark room), the beginner or careless observer by a quick movement of the mirror will say at once that "a + 2.50 D. over corrects," whereas the accurate observer by moving the mirror very slowly will take note of the small central shadow which just moves with the mirror. See Fig. B, page 9.

The reason for this failure of the quick movement to detect the central shadow is, that the peripheral rays were noted, and hastened so that the central shadow was obscured. The central shadow should always be looked for carefully, and when once noted, there is no reason why the skiascopist should not refract each eye to its exact correction to the 0.12 of a diopter.

XII. The point of reversal. This is difficult to determine. It is easy to tell when the shadow moves with or against the light on the face, but to get the exact point where there is no movement is not easy.

Having determined at one meter that the shadow with a + 1.50 D. just moves with the light on the face and against with a + 1.75 D., we know that the reversal point must be between the two or at + 1.62 D. This demonstrates how we arrive at the exact correction, and also the capability and accuracy of the shadow-test.

The method of obtaining the point of the reversal at points other than the regulation one meter, requires such an amount of extra measuring and computing that it does not meet with the general favor and satisfaction accorded to that found by producing an artificial myopia of one diopter.

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THE HALO, OR RAINBOW SYMPTOM IN GLAUCOMA.

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THIS is more of a theoretical paper than a practical one. Theory is important for the interpretation of facts, but is worth little unless it can explain its own phenomena, and it must effect this without contradicting itself; accordingly the facts are sometimes made to suit the theory, rather than the theory the facts; and is acceptable on the whole, more for its plausibility than for its solidity. Darwin once advanced a theory in which he informed us that the reason why the bosom of a beautiful woman was an object of such peculiar delight, arises from the fact that all our first pleasurable sensations of warmth, sustenance and repose, are derived from that source. This theory had a fair run, until someone happened to reply that all who were brought up by hand and derived their first pleasurable sensations from a very different source, and as yet, not one of all these had ever been known to evince any very rapturous or amatory emotions at the sight of a wooden spoon or gum nipple.

Several theories have been evolved as to the cause of the rainbow, or colored rings of light which appear in glaucoma, principally by older authors, none by our modern writers, who simply refer to it as an existing fact, but do not explain its cause. The general inference being, that it is due to the increased tension, but its modus operandi is disputed.

It is spoken of as a prodromal symptom of glaucoma, which is an error, inasmuch as it may occur at any stage of glaucoma, *prior to the destruction of the cornea* from excessive inflammation. The impression probably originated before the differentiation between glaucoma inflammatorum, and glaucoma simplex, the latter not being recognized as glaucoma, but simply as a disease where there was increased tension with excavation of the optic nerve, without

inflammation and was considered a prodromal stage. It is in the first stage of glaucoma inflammatorum that the patient usually refers to the rainbow symptom.

The character of the symptom is described in text-books principally as a rainbow or ring of colored light, when the visual axes are directed toward a lamp or bright light. Not constant, appearing and disappearing during the course of the disease, regardless of the tension, *after it has once existed*, whether it be increased or temporarily decreased. Some books speak of shimmerings, or flying sparks of light in connection with it, but these are simply subjective symptoms due to muscæ volitantes, or retinal irritation, and should not be mentioned in connection with the halo symptom, except as a co-existing symptom; they are not pathognomonic of glaucoma, inasmuch as they exist in other conditions regardless of tension, and are not dependent on it.

I take the liberty to quote at length from a recent article on this subject, by Dr. S. O. Richey, of Washington, D. C., appearing in the July number of the ANNALS OF OPHTHALMOLOGY AND OTOLOGY, in which he says that "the cause of the halo would seem not to be in the retina itself, but in the media anterior to it. Its variability suggests the aqueous humor, or some surface subject to the influence of the aqueous humor, for it is in the *serum* of the blood that the chief deviation from the healthy standard is perceived, by the products of excretion which have not been eliminated. When the urates in the blood are in excess (uric acidemia), the same influences which determine their presence in the synovial fluid of the joints and their precipitation upon the serous surfaces operate in the eye which is more exposed to vicissitudes of temperature. Hence, variations of glaucoma halo, with variations of urates in the blood, might clearly occur without present change of intra-ocular tension," and claims these urates to exist in the form of "sodic chlorid combined with uric acid which forms shining rhombic prisms, and that the halo is produced by the reflection of rays of light on these urates." Having for his argument, the lunar halo, which according to the accepted theory, (Descartes) is owing to the refraction and reflection of rays of light by minute snow and ice crystals in the upper strata of air, and occurs in the presence of the cirrus, or ice-cloud, as an analogy. And further says that the transposition of colors, which are reversed in glaucoma, the red being on the outer margin instead of the inner margin, is "strong evidence that the cause of the glaucoma halo is to be looked for posterior to the iris, in accordance with the disposition of rays of

light passing through the aperture of a screen." If this be so, and the reversal of colors in the glaucoma halo be due to transposition, then the colors in the rainbow after a shower, which is anterior to the iris the same as the lunar halo, would be transposed also, and should be arranged the same as in the lunar halo; red on the inner margin, but it is not. It is red on the outer margin the same as the glaucoma halo, making it evident that the cause of the glaucoma halo is anterior to the iris exclusively, and makes the theory of the transposition of the former doubtful. According to the disposition of rays of light passing through an aperture in a screen, there is an inversion, the object is in an inverted one but no color or detail of it is transposed, a simple inversion of a circle or halo would make no perceptible change in its appearance, the colors retaining the same position as they did prior to the inversion. If it were due to the non-eliminated excretions from the serum of the blood, then its appearance would naturally be expected at any time in any disease of the eye where tension does not take part, and confined to people of rheumatic or gouty diathesis, which it is not. If it were due to precipitated urates on the retina, then we would expect to find some deposits with the ophthalmoscope which we do not. In synchysis scintillans we have particles of cholesterin in the vitreous which are distinctly discernible as bright, glistening crystals, but produce no halo. The rainbow symptom does not exist except where there is, or has been increased tension, not moderate tension, but sufficient to interfere with the circulation and produce edema, tension which if not relieved, will ultimately destroy the eye. Tension produced artifically by pressure on the eye by the fingers produces a narrow ring of white light with a black center opposite to the points of pressure *but no color*. Great abnormal pressure such as we find in glaucoma, and which exists in no other disease or condition, leaves nothing but excessive tension, to which the production of the halo can be attributed and the presence of intra-ocular contents, be they urates or what not, must be excluded as a causative factor. Tension then, as the prime factor, its effect as the immediate cause, gives us ample clinical condition upon which to base its production. Some three years ago, during an operative course on pig's eyes, I noticed when putting the eye in the mask and screwing it down to get as near the normal tension as possible, that with increased pressure I had a glaucomatous eye to all intents and appearances. I do not refer to the tension of the sclerotic, but to the appearance and condition of the cornea which assumed at once the peculiar smoky

reflex characteristic of glaucoma. That this was not due to the forced approximation of the lens to the cornea on account of the pressure being made posterior to the equator, was afterward demonstrated. When the pressure is removed the reflex disappears, and the pupil becomes black again. That this reflex, sometimes wrongly spoken of as opacity, is due to the pressure forcing the natural fluids the eye may have acquired (from the slight disintegration of the tissues after enucleation) through and into the lamellæ of the cornea is obvious, and that this is possible or probable is patent when we look at the cornea histologically, and that the same thing exists in glaucoma is demonstrated by Fuch under the head of the "Anatomy of the Cornea of Glaucoma" in which he says, in the cornea the cloudiness is found to be edema. The most anterior of the lamellæ of the corneal stroma are pushed apart by fluid. *But the fluid is especially apt to be found under the form of minute drops between Bowman's membrane and the epithelium.*

We have here a demonstrated pathologic anatomical condition, which coincides and is demonstrated by natural laws in the production of the rainbow, during a shower consisting of all the prismatic colors, their production depending, as is well known, on a double refraction and a single reflection of the sun's rays on drops of water. The vividness of its colors is increased or decreased in ratio to the finer or coarser division of the said drops, often occurring as a complete circle in the spray arising from cascades or fountains. We have here then two identical conditions, with identical results its non or disappearance in the glaucomatous eye based on the same laws as for its non or disappearance in the atmosphere, these beads of water being especially apt to be formed between Bowman's membrane and the epithelium layer of the cornea, explains how we may have its appearance in the eye at either high or low tension. Once the eye has been subjected to intra-ocular tension to the degree of interfering with the circulation sufficiently to produce stasis and edema of the cornea, a sudden dimunition of the tension, would not immediately relieve the edema of the cornea any more than the recovery of the heart of its former tone, or increased compensation, would cause the sudden or immediate disappearance of anasarca. So while the cause is removed the same conditions exist for some time after, and we have the halo during an interval of comparatively low tension. On the other hand its disappearance during enormously high tension is readily explained by the naturally increased edema,

causing a coalescence of these edematous beads of water forming a zone of liquid under the epithelium layer, which is finally lifted up in small blebs, destroying the proper relation of the parts for refraction, without which the colors cannot be produced as on a sheet of water there is nothing but a reflection.

To recapitulate: 1. There is no transposition of colors in the rainbow.

2. If the play of colors were due to the non-eliminated excretions of the blood, then we should have the symptom in other diseases of the eye in which tension is not a factor.

3. If it were due to deposits of urates on the retina, then at some time deposits should be discernible with the ophthalmoscope, which they are not.

4. It is, in my opinion, dependent on stasis and edema of cornea, the varying distinctness of said symptom, dependent on the varying stages of edema.

5. Its appearance in comparatively low tension being dependent on the non-absorption of the resulting edema of the cornea, from a previously high tension.

6. Its non or disappearance in enormously high tension is dependent on the naturally increased edema, causing a coalescence of the edematous beads of water under the epithelial layer, thus destroying the proper relation for refraction, without which the colors cannot be produced.

7. Intra-ocular contents must be excluded as a causative factor.

Westinghouse Building.

TREATMENT OF TRAUMATIC CATARACT ATTENDED BY RAPID SWELLING OF THE LENS

By James Moores Ball, M. D.,
of Saint Louis, Mo.

Professor of Ophthalmology and Otology in the Saint Louis College of Physicians and Surgeons.

THERE are many cases of traumatic cataract attended by rapid increase of intra-ocular tension, peri-corneal injection, and ultimate excavation of the optic nerve head, in which the foreign body either lodges in the lens or is withdrawn at the time of the accident. It is concerning such cases that I desire to speak. For years the practice of the profession has been to rely on the use of atropin if the symptoms be not severe, and to perform linear extraction if they be acute. This operation, linear extraction, is unscientific. Performed for the purpose of relieving undue tension evacuating the lenticular fragments, the very nature of the operation has been such as to diminish the first only temporarily and

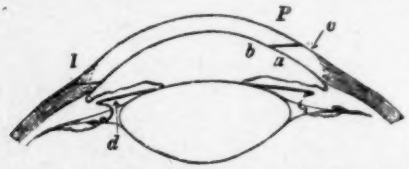


Fig. 1.—Diagram showing site of corneal wound in linear extraction. The line between b and the arrow indicates the direction of the incision in linear extraction; l, shows site of incision in my cases of traumatic cataract treated by extraction. (Fuchs).

defeat the second frequently. The situation of the corneal incision has been such as to preclude the possibility of removing all the fragments of the swollen lens. The oblique course of the wound has rendered its potency impossible while favoring its closure. Furthermore, the incision made by the ordinary keratome was too short. That such objections are not chimerical can be seen readily by a study of the accompanying diagram:

In the cornea we find that flap wounds gap more than linear ones; but the tendency toward gaping depends more upon whether the wound traverses the cornea perpendicularly or obliquely. The

former is more particularly the case in wounds made with the Graefe knife, in which the knife passes through the cornea from within outwards, while the latter condition exists when the lance-knife is used. These wounds do not gap because the instrument passes obliquely through the cornea and the lips of the wound close like a valve. This closure is caused by intra-ocular pressure. This force presses as strongly against the posterior lip (*a*) of the wound as upon the anterior lip (*b*). The wound must be made to gap before the softened lens matter can escape. Gaping of the wound can be produced not by the application of force opposite the site of the corneal incision, but only by pressure applied just peripheral to the wound (at *c* in Fig. 1). You can readily imagine that such a wound will not permit the removal of the diseased mass; in fact, only the softest portion of the lens can be evacuated, and irrigation of the anterior chamber is out of the question. Such are the objections to an operation which has the sanction of authority and the prestige of age.

The proposition which I desire to advance is this: In cases of traumatic cataract, with rapid swelling of the lens, an operation should be performed; and that operation should be, not linear extraction as has been the rule heretofore, but an extraction made with the Graefe knife, the incision being located in the corneo-scleral junction. The knife should cut from one-third to two-fifths of the corneal circumference, according to the extent to which the softening process in the lens has advanced. If glaucomatous symptoms supervene, with softening of only a small part of the lens, as in case I, which I shall presently report, the corneal incision should be large; if the softening involve the whole lens the incision should be of less extent. The extent of the incision of the cornea is of little importance provided we make an aseptic operation. The chief merit of the operation which I advocate lies in the avoidance of the valve which we saw produced by the linear method; in other words, my method in these cases permits the free evacuation of all the lenticular substance with the least amount of traumatism. An iridectomy is not made. All the debris is removed at once. This cannot be accomplished by the linear method. In support of the proposition I desire to report two cases:

Case I. Traumatic Cataract; Extraction of Lens; Successful Result.—J. H., boy, 9 years of age, was struck in the eye by a needle, which pierced the cornea near its center and entered the lens. Opacity of the lens developed gradually, the len's substance protruding through the puncture into

the anterior chamber, forming a rounded mass with a well-defined pedicle. Four days before consulting me inflammation developed; the eye became hard and painful. A careful examination under atropin and oblique illumination showed the condition described above.

Here was a case in which the classical operation for traumatic cataract —viz. linear extraction—was evidently out of place. Much of the lens was not softened; nevertheless, the eye showed increased tension, and this, unless soon relieved, would destroy vision. Since it was evident that the greater portion of the lens could not be removed by the linear method, I immediately made an extraction, passing a Graefe knife at the apparent corneo-scleral junction and severing about two-fifths of the circumference of the cornea. The lens was then extracted through a natural pupil, the eye dressed antiseptically, and the dressing kept constantly moist with a solution of bichlorid (1 to 300). Healing followed rapidly, and at the end of sixteen days the boy's vision in the affected eye equalled $\frac{1}{20}^{8}$.

Case II.—Traumatic Cataract; Extraction; Great Loss of Vitreous; Successful Result.—A few weeks after the discharge of Case I, another boy, 11 years of age, was brought to me with the statement that the thorn from some kind of a "creeper" had injured the eye a few weeks previously. Examination showed a congested conjunctiva, a faint corneal opacity marking the point of injury, dilated vessels in the peri-corneal zone, the anterior chamber almost obliterated by the pressure of a swollen lens, and great increase of intra-ocular tension. The eye had been painful for three days; At the time of the accident, and for several weeks following there was no pain.

This was a case of linear extraction, and yet I was sure that much of the lens was still unsoftened and could be removed by the linear operation only with great difficulty if at all. Consequently, I again used a Graefe knife, great care being taken lest the knife pierce the iris and cut out a section of that diaphragm. The section was made as in the previous case, with this difference, that the line of the incision was about one millimeter in advance of that in Case I. The greater part of the lens was softened and followed the knife. I was gently pressing with the cataract-spoon opposite the incision and working out some fragments of cortical matter, when suddenly there was a gush of vitreous. Immediately the protruding vitreous was cut off with scissors, only to be followed by more and more vitreous. The speculum was removed, the lids gently but firmly closed, and an antiseptic dressing applied. The next morning the lips of the wound were found to be approximated, the anterior chamber restored, and the conjunctival culde-sac filled with small floating particles of vitreous. The case progressed favorably and at the end of the fifteenth day the child's vision equalled $\frac{1}{30}^{5}$.

The loss of vitreous in Case II was due to the fact that the pupil was greatly dilated by atropin. If atropin had not been used I feel that there would have been no loss of vitreous. An iris with a pupillary opening of normal size forms a cap or covering to the vitreous and helps to retain that humor within the globe. Consequently the loss of vitreous in Case II should not be urged as an argument against this method of treating traumatic cataract. The

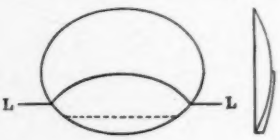
successful issue of two cases of traumatic cataract with inflammatory symptoms, treated in a manner not described in our text-books, leads me to believe that the commonly accepted treatment (linear extraction) is a mistake. I believe that an extraction through a large wound made by the Graefe knife, thus permitting the removal of all softened or semi-softened lens matter, will give better results than linear extraction.

810 Olive Street.

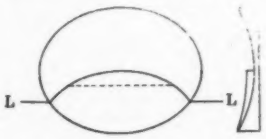
A PROBLEM IN CEMENTED BI-FOCAL LENSES. SOLVED BY THE PRISM-DIOPTER.

By Chas. F. Prentice,
of new york.

IT is intended here to illustrate the principal defect which so frequently leads to disappointment in the use of cemented bi-focal lenses, as well as to explain the technical means by which it may be prevented. When occasion demands, it is common practice among oculists to prescribe glasses for "reading" and "distance," with rather vague instructions to the optician to provide the necessary lenticular corrections in the form of bi-focal lenses. These, in the event of their being of the so-called "perfection" variety, the optician executes by cementing wafers of glass to the surfaces of the lenses which fit the areas enclosed by the eye-wire; both of the wafers being cut from the peripheral edges of that lens which produces the requisite amplifying or reducing power in the lenticular combination. The principal effort of the optician, at present, is to make this lens as thin as



(*Fig. 1.*)



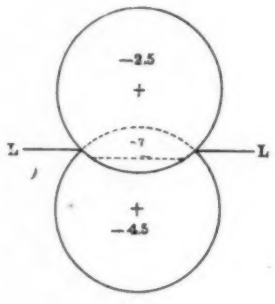
(*Fig. 2.*)

possible, and to reduce its diameter so as to enable him to secure at least two wafers of sufficient size for the ocular fields required.

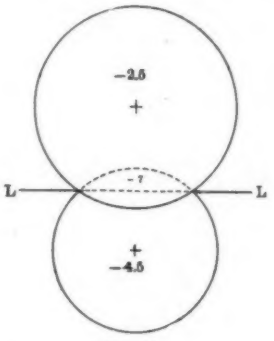
Economy and extreme thinness of wafer are doubtless desirable, but these are only of minor importance. Spectacles as now constructed, exclusively with this in view, are rarely ever free from a prismatic action, operating vertically, which renders them very uncomfortable to wear, and frequently useless, or harmful. This is especially true for high degrees of curvature, *and in cases involving combination with cylinders*, where the spherical refraction is obtained by spherical curvature of *one* surface only. With a view to brevity, only the latter type of correction will be discussed.

The accompanying diagrams will serve to illustrate the defect referred to:

In figures 1 and 2 the lines L—L are drawn on paper, placed several inches behind the bi-focal sphero-cylindrical lens. The line viewed through the cemented lens appears disconnected, being deflected by the prismatic action resulting from decentration of the "distance" and "reading" lenses, relatively to each other. It is, of course, customary to have the lower smaller field for reading, as above shown, but, for convenience of easier demonstration, the reader may make the interesting experiment of superposing two concave lenses, say 4.5 D. and 2.5 D., on which the optical centers have been previously marked with ink dots, and allowing them to occupy the positions shown in Fig. 3, in which the overlapping parts would be the smaller field for distance.



(*Fig. 3.*)



(*Fig. 4.*)

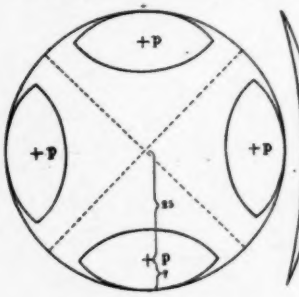
By more widely separating the lens centers, it will be observed that the disconnected portion of the line LL, as seen through the lenses, will appear displaced to a lesser degree, and, if the upper concave lens 2.5 D. is chosen of sufficient diameter, it will be possible to secure a distance between the lens-centers which will exhibit the line LL, unbroken, as in Fig. 4. This shows that the prismatic action depends only upon the distance separating the lens-centers, and therefore also that *the lens*, specifically in this case the upper one, from which the segmental wafers should be cut, *must have a definite diameter for every combination*, if the prismatic action is to be eliminated. We will cite an example in which we have for distance: 7 — 2 cyl. 180, and for reading: 4.5 — 2 cyl. 180, which, executed as a cemented bi-focal lens, calls for a + 2.5 periscopic wafer. This leads us to the proposition: WHAT PERIPHERAL SEGMENT OF A 2.5 D. PERISCOPIC CONVEX LENS SHOULD BE USED AS A WAFER TO INSURE FREEDOM

FROM PRISMATIC ACTION IN THE CENTER OF THE WAFER 7 MILLIMETERS BELOW THE CENTER OF THE DISTANCE LENS: — 7 — 2 CYL. 180?

The key to its solution is to be found in the law that "a lens decentered one centimeter will produce as many prism-diopters as the lens has diopters of refraction."[1]

The center of the wafer being 7 millimeters (0.7 cm.) below the center of the distance lens, makes it obvious that we have a prismatic action at this point, operating vertically, and due to the decentration of both the spherical — 7 and the cylinder — 2 ax. 180, which is equivalent to a decentration of 0.7 cm. on 9 D. to be neutralized by the wafer. Reverting to our law: 9 D. decentered 1 cm. affords $9^{\triangle}$ (prism-diopters) $\triangle$, therefore, 0.7 cm. will give 0.7 of 9 or $6.3^{\triangle}$ as the prismatic action to be overcome.

The wafer + 2.5 decentrated 1 cm. gives only $2.5^{\triangle}$, so that it takes a decentration of 2.5 cm. to produce $2.5 \times 2.5^{\triangle} = 6.25^{\triangle}$,



(*Fig. 5.*) (*Fig. 6.*)

which it will neutralize, with the error of $0.05^{\triangle}$, when placed with its thin edge at the lower edge of the concave distance lens. The lens + 2.5 to be large enough for so great a decentration must be, as will be later shown, at least 64 millimeters in diameter, and should be ground to a knife-edge to insure maximum thinness. As this case is one that came under my own observation, the instructions given to the mechanic who successfully executed the lenses, are here repeated as follows:

"Make a 2.5 D. periscopic convex lens (+ 7 — 4.5) 64 millimeters in diameter, worked to a knife-edge at the periphery, and, after marking its optical center, lay off four points, P. P. P. P., 25 millimeters from the center, as shown in diagram Fig. 5:

[1] A Metric System of Numbering and Measuring Prisms, by Chas. F. Prentice, pages 130 and 131, *Archives of Ophthalmology*, Volume 19, No. 2, New York, 1890.

"Replace the lens on the *convex* grinding tool, and cut the lens through the indicated dotted right-angled diameters into four equal parts. This will secure four wafers and will provide against accident. Select for both eyes two of the most perfect quadrants, and cut from them the peripheral segments to the shape indicated, and cement them into the concave 7 D. spheres, with their thin edges down, when a line LL viewed through the reading lenses will appear continuous as in Fig. 6."

It is obvious that the diameter of the lens is determined by adding twice the decentration (25×2) to one full width of the wafer (7×2) which gives 64 millimeters.

It would be very difficult to solve this simple problem so lucidly by any other means than the prism-diopter.

RETINITIS PIGMENTOSA. REPORT OF CASE.

By Dunbar Roy, A. B., M. D.,
of Atlanta, Ga.

Professor of Ophthalmology and Otology in the Southern Medical College.

By the term retinitis pigmentosa is meant a degeneration of the retinal tissue with a deposit of pigment in its deeper layers, accompanied as it always is by certain characteristic subjective symptoms. The term "retinitis pigmentosa" is certainly histologically misleading, for one would naturally expect in that event to find an inflammatory condition of the retina with the attendant increase of elements which usually takes place under this pathologic condition, while, in fact, the morbid process is atrophic rather than hyperplastic. Prof. Fuchs in his late text-book on ophthalmology uses the term "pigmentary degeneration of the retina," which is certainly more suitable, since it affords a clearer idea in regard to its minute histology. Mr. Frost, of London, in a lecture upon this subject, and which was also published in the *British Medical Journal* of Dec. 1889, takes exception to the term "retinitis pigmentosa" as being misleading, because, first, the disease is much more of a degenerative than an inflammatory type; secondly, pigmentation of the retina occurs in other conditions; and thirdly, in many cases which must certainly be included under the title, retinal pigment is present in quite an insignificant quantity. Having thus pointed out as to what is meant by the terms which head this article, I shall proceed to narrate the history of a case which came under my care some time ago, and which presents the question of hereditary transmission in this disease:

Mr. P. L., 29 years of age, editor of a paper in the southern part of the state, was referred to me by his family physician to see if there could not be an improvement made in Mr. L's vision.

The family history showed that both father and mother were living, the former being in his seventieth and the latter in her fifty-sixth year. Both are strong and healthy. The patient has five brothers and two sisters living and one brother dead. His father has never suffered with any disease of the eyes and of late can read without glasses, which is probably due to incipient cataract. He also commenced wearing glasses when he was sixteen years old, although they did not materially aid his vision, complaining at the same time that his sight became much worse towards evening. He also complains of severe headache.

Patient's grandmother (father's mother) became totally blind at the age of sixty, having suffered in her early years just as the patient's father. His grandfather had no impairment of vision. The brother who died was affected with his eyes in the same manner as our patient, while the younger sister, 12 years of age, is similarly afflicted. The remaining members of the family have good vision.

Past history: Patient has never had severe illness within his recollection nor has he ever suffered with any venereal trouble. On this latter point the history is very clear. His mother discovered when he was a year old that he could not see well, especially towards evening. He himself has noticed this dimness of vision for a long time and seemingly it becomes neither better nor worse. Towards evening he is almost perfectly blind, and hence dark days are troublesome to him. He can see perfectly well when looking directly in front, but if he is crossing the street he cannot observe vehicles which come upon him from the sides. Has tried numerous glasses without the slightest improvement.

Examination of the eyes: O. D., V. $= \frac{20}{30}$, not improved by glass. O. S., V. $= \frac{20}{30}$, not improved by glass. Javal is negative as far as astigmatism is concerned. Pupils react to both light and accommodation. The perimeter shows marked contraction of the field of vision, extending out not more than 10° in any direction. This latter was for white, while for colors it was still more marked.

Ophthalmoscope reveals a hazy optic disc. The macula cannot be seen probably due to the degenerative changes. Scattered in the retina, especially towards the periphery, are "web-like" splotches of pigment resembling bone corpuscles in shape, which is a form so characteristic of this disease.

With these objective and subjective symptoms before me it was not difficult to make the diagnosis of retinitis pigmentosa, which is claimed by some authors to be one of the easiest recognized of all ocular diseases so characteristic are its symptoms. Of these latter three are considered pathognomonic, although they may not all be discoverable in the same case. These are:

1. Hemeralopia[1] or night blindness, *i. e.*, a reduction in the acuity of vision when there is a reduction in the surrounding light.

2. Contraction of the field of vision for all colors.

3. The presence in the retina of pigmented spots in the shape of "bone corpuscles."

Hemeralopia and contraction of the field of vision are symptoms which are universally present while pigmentation of the retina recognizable by means of the ophthalmoscope is by no means so universal. The symptom hemeralopia cannot of itself be pathognomonic of this disease, although the most characteristic for there are other affections of the eyes in which it is present, but

[1] The word "hemeralopia" continues to be used, for the want of a better term, though it is indefinite, pathologically.

it is also true that this symptom is more universally coincident with some disease of the retina than in any other ocular affection.

Chas. Zimmerman, in an excellent article in the *Archives of Ophthalmology*, Vol. I, on "A Review of the Theories of Hemeralopia," discusses at length the different diseases of which this condition is a symptom, but arrives at the same conclusion which other authors before him have done, and that is that this symptom is much more frequent in diseases of the retina than in any other ocular affection. Von Graefe has said that hemeralopia constitutes the most characteristic symptom of all others in diseases of the retina. Uhthoff in the *Berliner Klin. Wochenschrift*, 1890, gives a very interesting contribution to the subject of this symptom and attributes many cases as due to strong sunlight and imperfect nourishment. Among 15,000 demented men, one-third of whom were "topers," there were twenty-seven cases of hemeralopia. According to Prof. Leber, of Heidelberg, now recognized as being the best authority on ocular pathology, this symptom is caused by a congenital atrophy of the retina to which in the later stages is added pigmentation. The same writer also remarks that the pigmentation cannot always be seen with the ophthalmoscope which is another argument against the use of the term retinitis pigmentosa. That such undoubtedly occurs is seen from a case reported by Porut, quoted by Zimmerman in the volume of the *Archives* referred to. A man, 21 years old, suffering from congenital hemeralopia died of scarlet fever. An anatomical examination of the eye was made, and there was found a deposit of pigment in the deeper layers of the retina, especially in the external granular layer.

Some writers, especially Mormoyer, think that the stimulating light of the sun produces a deposit of pigment similar to those on the skin. Prof. Schweigger, of Berlin, a most careful observer and writer, has noticed the presence of hemeralopia and contraction of the field of vision in children before the appearance of any pigment in the retina. He also observed in older persons hemeralopia and contraction of the visual field without any trace of pigmentation of the retina or any other symptom except contraction of the arteries and paleness of the disc. He, therefore, thinks that the torpor of the retina is, in all probability, not due to pigmentation of the retina, but to the obliteration of the vessels or of their caliber through hypertrophy of their coats so that the retina obtains a diminished and insufficient supply of blood. These ideas of Schweigger agree in a great measure with the facts since ascertained by microscopical study.

Wangenmann has furnished an excellent article in Graefe's *Archives*, April, 1891, dealing with the micro-anatomical study of an eye which had suffered from retinitis pigmentosa. He arrives at the same conclusion as before theoretically announced by Prof. Leber, and that is that the condition in the retina arises from disorders of the choroidal circulation—a theory also supported by the facts of experimentation since it has been found that if obliteration of the choroidal circulation be produced, the condition of retinitis pigmentosa will also follow. Thus all investigations have shown that this pathologic condition is dependent more or less upon a mal-nutrition of the retina while clinical cases have clearly demonstrated that heredity plays a most prominent role. Many writers have reported cases bearing upon this latter point and it is only for this reason that I have detailed the case above. So conclusive has been the evidence as showing the importance of heredity and consanguinity in this disease that it is now almost universally accepted.

Mr. Morton, of London, has reported an interesting case showing not only the stamp of heredity, but also the fact that objective changes in the retina are not always discernible. The case was one of an uncle and nephew where there were all the subjective symptoms of retinitis pigmentosa, night blindness, contraction of the visual field, but no objective changes could be seen with the ophthalmoscope. Fifteen members of the family were affected in the same way, and strange to say, they were all males.

Mr. J. Hutchison in vol. I of the *Ophthalmic Review*, has given us an excellent article on this ocular disease and its allied affections as illustrating the laws of heredity. He reports in all twenty-three cases, eight of which sprang from marriages among relatives, among whom there was no record of a previous case of the kind. The author thinks that consanguinity is undoubtedly as important a factor in the development of retinitis pigmentosa as it is for deaf mutism and idiocy.

Macheck quoted in the *Archives of Ophthalmology*, June, 1882, gives cases of seven children of consanguineous parents, five of whom were affected with retinitis pigmentosa, hemeralopia and atrophy of the disc. The symptoms first manifested themselves after the tenth year. The eyes were mostly myopic, three had color blindness, one being complete, and the other two partial.

Priestly Smith, in the *Ophthalmic Review*, vol, I, December, has reported an interesting case of retinitis pigmentosa connected with the history of maternal shock. In the case as recorded there was no constitutional nerve disorder in the earlier generations and no consanguineous marriages. All the children were healthy.

The patient had suffered a severe nervous shock during early months of pregnancy and the child thus delivered and all subsequent children developed retinitis pigmentosa with partial deaf mutism. The last case is interesting and bears out the statement made by Prof. Fuchs that "it (retinitis pigmentosa) is often found at the same time with other congenital anomalies like deafness, mental weakness, harelip, etc."

An unusually interesting case is mentioned by Norris and Oliver in their late text-book on ophthalmology. Currier, in a memoir published by the *Soc. de Medicine de Grand*, 1838, has related the history of a family in the commune of Vendemian, near Montpelier, in which the hereditary transmission could be traced for two centuries or six generations. So universally is there a history of heredity or consanguinity in all cases of this disease that when such is not the case they are reported for their variety. For instance, Ayres, of Cincinnatti, has reported such a case simply on the grounds of the absence of a history of consanguinity.

The lamentable fact remains that like some other diseases that are easily diagnosed retinitis pigmentosa is unfortunately, but little, if any, benefitted by treatment.

At the last meeting of the International Ophthalmological Congress at Edinburgh in August of this year, Valude reported certain forms of optic nerve atrophy which he had successfully treated with antipyrin. The report did not say whether he used this remedy subcutaneously or not. Since in a large number of cases, atrophy of the optic nerve is present with this condition of retinitis pigmentosa, we do not see why the same remedies would not be beneficial in both cases, especially as the changes are of the degenerative type in both.

Haskett Derby, of Boston, has reported several cases where the patients have received decided benefits especially by the increase of the visual field through the application of a weak galvanic current about the eyes.

To sum up our ideas as expressed in this article:

1. Retinitis pigmentosa is an atrophy of the retina followed in the later stages by a deposit of pigment beginning usually in its deeper layers.

2. Its most prominent symptoms are: (*a*) Hemeralopia or night blindness. (*b*) Contraction of the field of vision for all colors. (*c*) The appearance in the fundus oculi of pigmented spots in the shape of "bone corpuscle" especially towards the periphery.

3. It is a disease in the majority of cases hereditary, and more especially if there is a taint of consanguinity in the family.

4. The treatment seems to be powerless, but those remedies should be used which are nervines and alterative tonics.

The Grand.

RIPENING OF IMMATURE CATARACT BY DIRECT TRITURATION.

By Boerne Bettman, M. D.,
of Chicago.

BY way of introduction of my report of a successful case of ripening an unripe cataract by direct trituration, permit me to review in a concise manner the history of this innovation and the reasons which led to its adoption.

Up to ten years ago oculists regarded the complete maturity of a cataract as a *sine qua non* prior to the undertaking of an operation. Old men and women were forced to wait tedious months and years for the fruition of their hopes, and only then when qualitative vision was entirely abolished, when sight was reduced to mere perception of light would the operator venture to extract the lens. The pleadings of patients for more rapid relief, and the inherent instinct of progressive men for medical advancement prompted many oculists to devise methods by which maturity of the cataract could be hastened. The one most frequently employed is that of Förster, of Breslau. The principle involved is to break down the lens fibers and thus induce their rapid degeneration and opacity. This is accomplished by pressing on the cornea, after doing an iridectomy, with a spoon or strabismus hook. The force is transmitted indirectly to the unripe cataract, and through this massage it is rendered entirely opaque in a varying period of time.

Many observers complained of the iritis set up by the mechanical irritation to which the rainbow membrane is subjected by this procedure. Mr. McHardy in a paper read at the Eighth International Congress of Ophthalmologists, held at Edinburgh, in August, 1894, mentions its occurrence in this connection in from 2 to 17 per cent of all his cases. Another objection which held good in 1883 was the necessity of doing an iridectomy. This, however, has been obviated since White, some two or three years ago, introduced his modification of first making a paracentesis, and drawing off the aqueous humor, thereby permitting the lens to come in contact with the posterior surface of the cornea, and then making massage. To obviate these difficulties and to insure more rapid ripening, I in 1883, for the first time, essayed my method of direct trituration. The result obtained was so satisfactory that I

have depended upon it ever since. Up to the time of the introduction of the simple extraction, I combined the massage with an iridectomy. In the last few years, however, I have not excised a piece of the iris, but have practiced the simple direct massage only. After entering the anterior chamber with a small lance-shaped knife, as is done in a glaucoma operation, a trowel-shaped spatula is introduced, its flat surface placed against that of the lens, either in the pupillary area or when the iris is contracted underneath the iris and a half dozen to a dozen passes made over the cataractous lens. The pressure exerted is uniform and naturally not very severe. This done, the spatula is removed, the eye washed with an antiseptic solution and bandaged never longer than two days. Ordinarily one day will suffice.

In 1887 I first made known my operation in a paper read before the Chicago Medical Society, and later published in the first December number of that year of the *Journal of the American Medical Association.* In the discussion which followed fear was expressed that direct massage might cause dislocation of the lens and subsequent complications, as cyclitis and destruction of the eye. These *a priori* objections were replied to and satisfactorily explained. In a subsequent article published in 1892 in the *Chicago Medical Recorder* of April, a report of seventeen successful consecutive cases, with excellent results in each, must be regarded as conclusive evidence of the innocuousness of direct trituration. In only two of the cases reported was there a slight escape of vitreous during the extraction of the cataract due to accidents at the time of the operation. This slight mishap, however, did not affect in the slightest degree the final results.

During the last few years authorities like Knapp and Hirschberg have decried all methods of artificial ripening. They claim they are unnecessary, since cataracts can be successfully extracted even if not perfectly mature. The danger of transparent lens substance which may adhere to the posterior surface of the anterior capsule or in the bag proper, is not feared by Knapp, owing to its imprisoned condition in the capsular sac which follows a peripheric capsulotomy. Others again, especially Wickeriawicz, thought the transparent lens substance which did not escape with the main body of the cataract could be flushed out of the anterior chamber with an antiseptic solution. At the Milwaukee meeting of the American Medical Association in 1893, I devoted special attention to these points in a third paper on the subject of "direct trituration." I again advocated the harmlessness of my method by

describing experiments made on rabbits for the express purpose of determining the amount of pressure which could be exerted upon the lens without disturbing its anatomical relationship; in other words, to ascertain how forcibly the lens could be triturated without rupturing capsule and suspensory ligament. In every case I succeeded in producing more or less opacity of the lens; in none was injury done to the capsule or zonula zinn, although the trituration was far more severe than I would dare to attempt in a human eye. I also reported two cases in which the cataract was so slightly advanced that a dim view of the fundus was discernible. I wish to re-emphasize in this paper, as I have done in the others, that I exclude from these remarks sclerosed amber-colored cataracts such as never become altogether opaque. These two cases which were successfully ripened, and extracted within three weeks were intended to refute the claims made by the adherents of extraction of not fully mature cataracts, for I doubt whether any conscientious oculist would have ventured to operate on the cases to which I have just referred, in the slightly advanced condition or stage of opacity of the lens in which I found them. To the query, at what stage of immaturity of the cataract the advocates of extraction of unripe lenses operate? How slightly advanced may the cataract be when these gentlemen will attempt its removal?

No answer was given in the discussion which followed the reading of my paper. The time is long since past when complete maturity of a cataract is deemed essential before an operation is considered justifiable. Very few men will hesitate to remove an opaque lens with the superficial part of the anterior cortex still transparent. Extraction of cataracts (softer variety) from eyes having $2\frac{3}{200}$ vision is now practiced daily. But do the defenders of early extraction operate where fingers can be counted at a distance of from 8 to 10 feet? Do they attempt to remove cataracts (softer variety) through which parts of the fundus can still be seen? Until I am answered in the affirmative, I shall continue to doubt the advisability of extracting such, relatively speaking, highly immature cataracts.

The statements made with regard to the removal of unripe cataracts must be accepted with limitations which have not as yet been accurately defined. As an illustration of the above, I will detail the clinical history of Mr. H. C., who was operated on a few months ago. He was admitted into the Illinois Charitable Eye and Ear Infirmary June 26, 1894, with the following diagnosis: R. E. immature senile cataract. Anterior cortex, with the excep-

tion of a few broad striæ at the outer edge, perfectly transparent. Body of lens showed broad satiny opaque bands. A dim red reflex obtained on ophthalmoscopic examination through parts of the lens. When patient is placed with back at the intersection of two windows at one end of a room, fingers are readily counted at a distance of 8 feet near the other end of a dimly lighted chamber. Obscuration of sight was noticed about three years ago. Left eye incipient cataract. On July 5, after having thoroughly cleansed the face, eyebrows, with soap, and, later on, the lids and conjunctival sac with a 1:5000 solution of bichlorid of mercury. I passed a small lance-shaped knife into the anterior chamber, entering about 1 mm. behind the upper corneo-scleral margin. The incision was made large enough not to interfere with the lateral movements of the trowel-shaped spatula. The latter instrument was quickly passed through the opening to prevent the escape of aqueous humor. The depressed flat end was slid over the lens in the large pupillary area. Firm but even to and fro passes were made, care being taken not to rub the iris with the shank of the instrument. After its careful and rapid removal, the eye was again flushed with the bichlorid solution, a drop of atropin was instilled and both eyes bandaged. The next day the eye appeared absolutely normal excepting a slight rosiness in the region of the incision. On the second day the bandage was entirely removed and the patient given the liberty of the institution. Two weeks later vision had decreased to perception of light only. On July 26 I prepared the patient for the subsequent extraction of the now fully ripe cataract by again subjecting him to the antiseptic rigor carried out in all operative patients. With a Graefe's knife I made a corneal flap upward through two-fifths of the corneal area. The rapid escape of the aqueous humor floated the iris upon my knife, necessitating an iridectomy which was followed by a T-shaped capsulotomy. The body of the lens was easily delivered. The sticky adhesive opaque cortex was readily forced out in bulk by pressure on the cornea by a spoon. Instillation of an antiseptic wash and atropin was followed by bandaging of both eyes.

July 29, bandage removed and eye found in a passive condition. From this time on the patient made an uneventful recovery. During the entire period no injection of the eye was present and patient did not complain of any discomfiture. On August 16 he was discharged, 12 D. glass giving him V. $= \frac{20}{40}$. He is expected to return for a change of glasses; the addition of a cylinder will

no doubt increase his visual power. Knowing that the cortex was opaque throughout and feeling certain that it could readily be removed, and thus avoid secondary iritis and cyclitis, I made a T-shaped opening in the capsule and have saved the patient the annoyance of a secondary operation. It may be argued that the discomfiture to the patient, arising from a secondary capsulotomy, is no greater than that due to trituration of the lens. This I readily admit. In both cases he is subjected to two operations. But other things being equal, by direct trituration he derives the greater advantage of having his cataract fully ripened and escaping the dangers due to floating pieces of transparent cortex in the anterior chamber. This danger is lessened by doing Knapp's peripheric capsulotomy. Furthermore, of more importance is the fact that direct trituration hastens the ripening of a cataract. It is applicable to such cases where an early extraction would probably not be undertaken. It saves the patient valuable time and relieves him much sooner of the miseries his complaint subjects him to. In conclusion, I will again repeat the conclusions deduced from my years of experience and the twenty-four consecutive reported cases.

(1) Artificial ripening of cataracts is in properly selected cases demanded; (2) direct trituration is preferable to other methods; it is easily performed by one possessing ordinary skill; (3) it is not followed by any untoward symptoms, consequently it is a safe and reliable procedure; (4) it is not indicated where sclerosis involves the bulk of the lens; (5) it is especially useful in senile cataracts with soft cortex; (6) the results of the massage are marked and rapid; (7) maturity of the cataract is usually induced in three weeks, often sooner; (8) very little discomfort is caused the patient aside from bandaging the eye two days; (9) at the subsequent extraction of the lens, the cortical substance is readily removed and dangers of iritis and suppuration of the corneal wounds are lessened.

FIBROMA OF EYELIDS.

By Geo. H. Goode, M. D.,
of Cincinnati, Ohio.

Ophthalmic Surgeon to Christ's Hospital, and one of the Ophthalmic Surgeons to Ophthalmic and Presbyterian Hospitals.

PATIENT 35 years of age. Twenty-five years ago the growth appeared and slowly attained the proportions which it had when I first saw him. The length and width of the upper lid were double that of the normal; the thickness was about four times the ordinary. The lower lid was also affected, but to a less extent, and was entirely hidden from view by the upper lid, which hung over it and extended below the margin of the orbit. Figs. 1 and 2. The growth was not pedunculated, but there was a clear line of

Fig. 1.

Fig. 2.

demarcation between the hypertrophied and fairly normal tissue. So that I found that it would be possible to remove all of this structure without shortening to any degree the palpebral fissure. In order to procure anything like a normal lid, I found that it was necessary to remove a complete section of the outer third or more of the man's lids—as he presented himself. The portions removed were triangular in shape—the margin of the lid forming the base of the triangle, and the apex at the margin of the orbit. The flaps were drawn together and united by deep silk sutures. The dressing, which consisted of iodoform gauze, was not disturbed until the third day, when it was found that the wounds were firmly closed,

the parts coapted and the lids with their proper relation to each other. The ptosis which still exists is due to the still abnormal weight of the upper lid and also, doubtless, to the absence of the levator muscle, which has undergone changes from disuse. The eye itself has not suffered in the least, and it is possible that a ptosis operation may be of service to him.

It may be of interest to know that the man is the subject of multiple fibromata, having the characteristic growths (varying in size from a hazelnut to a walnut) scattered over his entire body.

EMBOLISM OF THE INFERIOR BRANCH OF THE CENTRAL RETINAL ARTERY.

By Geo. H. Goode, M. D.,
of cincinnati, ohio.

Mr. ———, 36 years of age, druggist, called to see me in April, 1894. He stated that several days before, while filling a prescription, he noticed that the upper half of the field of the left eye was suddenly obliterated. Upon examination with the ophthalmoscope my attention was immediately attacted by an opaque something, in relation to the lower branch of the central artery, situated a short distance from the papilla. Close examination with the direct method showed that there was a bulbous distention of the vessel. This, together with the bloodless appearance of the vessel beyond this point, made it evident that the condition had been produced by an embolus. The veins were not altered in size, the retina was edematous (almost the entire lower half appeared of a milk white color); there were no hemorrhages. Upon examination of his heart, I found that he had a mitral regurgitant murmur. He gave a history of inflammatory rheumatism ten years previous. I saw him but a few days ago and found his condition, as far as the vision was concerned, unchanged.

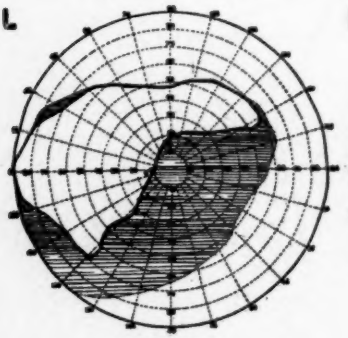
DETACHMENT OF THE RETINA.

By Wm. E. Bruner, A. M., M. D.,
of Cleveland, Ohio.

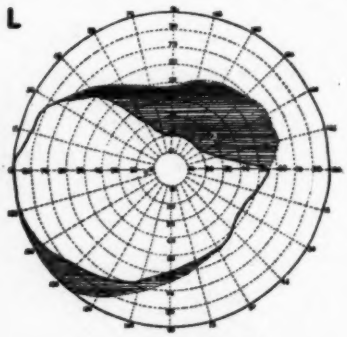
Clinical Assistant in Ophthalmology, Medical Department, Western Reserve University.

THE following case of detachment of the retina was of considerable interest to the writer, and, although not very rare, may be worthy of mention as showing the change in the location of a recent detachment from the upper to the lower portion of the fundus.

R. M., 50 years of age, had never had any trouble with his eyes until one week or ten days ago when he noticed while at work that he could not see anything with O. S. His general condition



(*Fig. 1.*)



(*Fig. 2.*)

is fairly good, but he occasionally has some chronic rheumatism. Denies venereal history. Is a rather heavy smoker. Urine analysis is negative.

Ophthalmoscope revealed in O. D. some fine floating vitreous opacities, slight general disturbance of choroid and partial crescent of choroidal disturbance at outer edge of disc. V., O. D. $= \frac{5}{15}$. With correction sph. $+ 1 \bigcirc +$ cyl. .25 ax. 180°, V. $= \frac{5}{5}$.

In O. S. the ophthalmoscope showed fine floating opacities in the vitreous, and a large detachment of the retina up and out, and another smaller one up and in. These two met in the far periphery, leaving a narrow triangular portion of the retina still

adherent between them above the disc. The whole macular region was included in the detached portion. The refractive condition varied from the ordinary in such cases in that it was here hypermetropic. Tension in the eye was normal or very slightly diminished. V. = counting fingers excentrically. The detachment could be seen to move with the movements of the eye, showing an accumulation of liquid beneath the retina. Careful perimetric measurement of the field gave the following result: (Fig. 1.)

Unfortunately it was impossible to give the patient any treatment which involved rest in bed, and we were obliged to do the best we could under the circumstances. Nine days later when he reported to the clinic, he had some central vision = $\frac{1}{40}$. The ophthalmoscope now showed reattachment of the retina over almost the entire area previously involved, and the retina normal in color with nothing but some choroiditis and some apparent wrinkles in the retina to show where the detachment had been. Directly below the disc, however, there was now a detachment much smaller than the former one, but extending far out into the vitreous.

The field as taken with the perimeter is shown in Fig. 2.

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ABSTRACTS FROM CURRENT AMERICAN AND ENGLISH OPHTHALMOLOGICAL LITERATURE.

By Charles H. May, M. D.,
NEW YORK.

CORNEAL SUTURE IN CATARACT EXTRACTION.

Dr. E. Kalt, Paris, (*Archiv. of Ophthalmology*, Vol. XXIII, No. 4). In order to diminish the danger of occurrence of prolapse of iris, Kalt uses a corneal suture in cataract extractions. He has practiced the procedure in fifty cases of simple extraction and was well satisfied with the results. He reports only two point-like hernias in these fifty cases—4 per cent, and says that without the suture he has never seen less than 8 per cent of prolapse among the 180 extractions which he performs each year. He says in this connection: "The corneal suture gives, I believe, a satisfactory solution of this prolapse question which has become a real nightmare. It is to be hoped that neither the spirit of routine nor the fear of making the operation two or three minutes longer will prevent the new procedure from spreading." He mentions Williams, of Boston, as having published encouraging results from suturing the cornea after cataract extraction in 1867, and also describes the method used by Suarez de Mendoza to accomplish the same purpose.

He describes his method of procedure in the following words:

"I use very fine, short, sharp-pointed needles and thin but strong silk thread. The needles, when armed, are sterilized in hot air and kept for use in a sterilized paper envelope. After cocainization and disinfection, I pass the needle through the cornea in the vertical meridian, about 1 mm. underneath the limbus; the point, without penetrating into the anterior chamber, emerges at the juncture of the opaque border, and the thread is drawn. Then the needle is introduced, about 1 mm. above its point of exit, into the episcleral tissue, as is done in the muscular advancement. As soon as I find that the point has penetrated into resistant tissue I draw it out again, in order to involve as little of this tissue as possible. As it is impossible to draw the needle out at right angles, about 2 mm. of conjunctiva are loaded on it, which is of no consequence. In drawing this thread I leave a loop, which is

placed sideways toward the nose, and spread out carefully so as to avoid twisting. The corneal section is made in the ordinary way, care being taken that the knife passes nicely through that portion of the cornea which the suture has left free. Then I take off the speculum and remove the cataract as usual. When the iris is well in position, an assistant hold the upper lid up, and I tie the thread.

"It is to be borne in mind that I do not, like Suarez, make a superficial incision into the limbus corneæ, in the depth of which lie the points of entrance and exit of the thread, for this makes the corneal section with the narrow knife very difficult without cutting the thread in so narrow a passage. The coaptation in my procedure seems to me quite sufficient. Furthermore, I am not afraid to draw the knot tightly at the risk of folding the cornea. This folding disappears in a day, and the corneal astigmatism is neither increased nor diminished.

"The suture does not inconvenience the patient. Rarely I remove it before the tenth day, when it has become quite loose. With one stroke of the scissors I cut off the knot, and seize the thread with forceps.

"Accidents to guard against: Involuntary cutting of the thread with the Graefe knife. This is rare. Generally a new needle can be passed through the hole of the old. When the suture is tied, we should draw on the superior, scleral end of the thread. The coaptation takes place by itself. The opposite would be dangerous. I can affirm that the suture infects the cornea in no way. The slight opalescence left in its track disappears quickly."

NOTE ON NINE HUNDRED AND TWENTY-FIVE EXTRACTIONS OF CATARACT.

Charles Higgens, F. R. C. S., Eng. (*The Lancet*, August 11, 1894.) The writer gives the results of 925 cases of extraction of cataract. Concerning his method of operating, he says: "My method of operating is now (and has been for many years past) to hold the upper lid away with the end of the ring finger, fix the eyeball below the horizontal meridian of the cornea, and make the forceps keep the lower lid out of the way (I rarely use a speculum). I make my incision with a Graefe's knife, by puncture and counter-puncture in the sclero-corneal margin, cut in the sclero-corneal margin to near its upper part, but finish the section rather within the corneal border. If I am going to do iridectomy, before commencing the incision I pass a suture through the

conjunctiva below the margin of the cornea and leave it hanging on the patient's cheek; then, if I want the eye drawn downwards, I tell the patient to look down, draw the suture moderately tight, and get an assistant to put his finger on it, and so the eye is kept fixed in the desired position without being touched with the forceps, and the silk thread acts as a speculum to the lower lid. I keep the upper lid out of the way with the finger of the hand which holds the iris forceps. I remove the cataract by pressure through the lower lid with my fingers, or directly upon the eyeball with the curette."

OBSERVATIONS ON SOME PHASES OF OPACITY, AND ON LUXATION OF THE CRYSTALLINE LENS.

L. L. Thompson, M. D., Indianapolis. (*The Ophthalmic Review*, October, 1894.) The author concludes his paper with the following resumé:

1. Segmental opacities of the lower inner portions of the lens usually remain stationary for many years, rarely do they cause blindness.

2. Annular opacity, or "Arcus senilis lentis," is often met with in persons under 30 years of age. Women seem to be more subject to it than men; it rarely passes beyond the periphery until after middle life, when it sometimes extends in the form of a minute speckled opacity of the whole anterior surface of the lens, again becomes stationary, and seldom causes blindness.

3. Cataract is occasionally cured spontaneously by liquid degeneration within the capsule.

4. Congenital ectopia lentis is by no means a harmless anomaly. Its subjects are usually highly myopic, and have greatly reduced acuity of vision. It may cause loss of vision by glaucoma, and ultimately destroy the sight by luxation of the lens downward, thereby starting inflammatory action.

5. Spontaneous luxation downward of a cataractous lens of an elderly person often takes place. It gives temporary sight to the patient, but the end is usually suffering and loss of vision.

6. "Second sight" is a danger signal. It is alwas caused by increase in the conjugate axis of the lens incident to incipient cataract. It is frequently present long before the faintest sign or symptom of cataract. It is often brought on by long-continued congestion of the fundus (as seen by numerous floating particles in the vitreous humor), by a relaxed suspensory ligament, and by luxation of the lens forward.

TROPA-COCAIN AS A LOCAL ANESTHETIC IN EYE SURGERY.

T. J. Bokenham, London, (*Trans. Ophthalmological Society, United Kingdom*, 1894). The writer's observations confirm the favorable reports already received concerning this new coca base. Schweigger and Silex had found that anesthesia from tropa-cocain came on more rapidly and lasted longer than that produced by a similar strength of cocain and that when prepared with a $^3/_4$ per cent solution of salt was practically free from irritation. Chadbourne found that it was four times less poisonous than cocain. Bokenham found that the new drug possessed but feeble toxicity as compared with cocain, and but little effect either upon the heart or blood-pressure. In a 3 per cent solution made up with saline solution it was practically non-irritating to the eye. Complete anesthesia was produced in two minutes with one or two drops of a 3 per cent solution: it caused no dilatation of the pupils, no paralysis of accommodation, no drying of the corneal epithelium, no dilatation of the conjunctival vessels. The 3 per cent solution was not quite strong enough for the use of the mitigated stick, and for this purpose, he used a 10 per cent solution.

His conclusions are: "(1) Tropa-cocain does not cause dilatation of the pupil, or any disturbanee of accommodation. (2) It is less poisonous than cocain, the toxic dose being at least four times as great. (3) It does not affect the vascular condition of the eye like cocain and the other local anesthetics. (4) It does not produce unpleasant effects if swallowed during an operation, nor does it produce discomfort in the throat like cocain. (5) In form of a solution it keeps far better than a corresponding solution of cocain, and in discs it would keep indefinitely."

A NEW OPERATION FOR TRICHIASIS AND DISTICHIASIS.

W. Spencer Watson, London, (*Transactions of the Ophthalmological Society of the United Kingdom*, 1894). This new "button-hole and button" operation is recommended for those cases of trichiasis and distichiasis in which the central part of the eyelid is chiefly or solely at fault. The first step is to make the "button-hole." "An incision is made through the posterior edge of the tarsal margin to the extent of 3 to 4 mm. and laterally to a little beyond the faulty lashes. This is completed by a transverse incision through the skin parallel to the tarsal margin deep enough to meet the upward incision and thus form a bridge of tissue including the roots of the lashes. (2) A "button" of oval form with its long axis parallel to the tarsal margin is now marked out

in the skin immediately above the "button-hole;" the skin and adjacent fibers of the orbicularis muscle, are incised in a curvilinear direction so that the lower border of the oval "button" corresponds with the line of the skin incised in making the "button-hole;" the deep surface of the "button" remains attached to the cartilage. (3) The "button" is passed downward through the "button-hole," and retained there by a few sutures and a dry dressing of cotton wool and styptic colloid. * * * The width vertically of the "button" may be varied according to the amount of inversion of the faulty eyelashes. Generally, it should be about 3 mm. in vertical width." The transposed "button" assumes a semi-mucous character and shrinks in dimensions.

A CASE OF CEREBRAL CLOT; LOSS OF VISION FOLLOWING INJURY; TREPHINING; RECOVERY.

John B. Hamilton, M. D., LL. D., Chicago, (*Journal of the Amer. Med. Asso.*, Dec. 22, 1894). Dr. Hamilton's case is interesting on account of the restoration of the sight of one eye after removal of a clot from the optic commisure. The patient had been injured six months previously by being struck on the top of the head just posterior to the fissure of Rolando of the right side. There was headache; right eye became gradually and totally blind; deafness of right ear beginning almost immediately after the injury; no motor paralysis, nor loss of taste or smell. Vision and hearing normal on left side. Ophthalmoscopic examination negative except "O. D. slightly vascular." The patient was trephined; temporary resection of cranial wall; the dura mater incised; silver wire loop passed downward and forward toward the optic commisure withdrew a firm round coagulum about 3 cm. in length; dura sutured; bone replaced and wound closed; patient recovered. Seven months later the patient was again examined. The vision had been restored from the date of operation. One year after the operation the patient had normal hearing and vision.

CELLULITIS FOLLOWING MULES' OPERATION.

Sydney Stephenson, F. R. C. S., (*Ophthalmic Review*, Sept., 1894, and *The Lancet*, Sept. 22, 1894). After pointing out that Mules' operation has been before the profession for nearly ten years and that great differences of opinion still exist as to its value, Stephenson narrates a case of cellulitis occurring in one out of a series of thirty cases in which the operation was performed, no

untoward results having followed in any of the other twenty-nine cases. The operated eye had been injured six years previously and was tender and irritable at the time of the enucleation. After three months the orbital stump was removed by dissection; an irritable remnant remained which did not tolerate the insertion of an artificial eye. The writer explains the accident as caused by septic infection either during the operation or else, and more probably, that organisms had been introduced six years before and that these had been roused into activity by the surgical interference.

THE USE OF CHLORIN WATER IN OCULAR THERAPEUTICS.

J. W. Lawford, London, (*Transactions of the Ophthalmological Society of the United Kingdom*, XIV, 1894). After pointing out that the employment of liquor or aqua chlori in ocular therapy is by no means new, the writer states that it seems to have fallen into disuse of late years and is not mentioned as a remedy in many of the modern text-books. His experience with the remedy has been very satisfactory when used as an antagonist to suppuration which had already begun. He appends the histories of a number of cases. In two cases of severe hypopyon the chlorin water was used as an injection into the anterior chamber with excellent results. To be suitable for use it must be freshly-prepared: it is very apt to decompose, the chlorin changing to hydrochloric acid and the preparation then being unfit for application to the ocular tissues. "I do not pretend that this remedy is wholly satisfactory," * * * "but I consider it one of the most applicable of the known germicidal remedies, and it has certain distinct advantages over some of its competitors. It has been shown experimentally that its effects upon the intra-ocular tissues is much less harmful than that of other strong antiseptics, and as an application to the surface of the eye it is less painful than any of the more commonly used solutions, *e. g.*, nitrate of silver, perchlorid of mercury, etc."

THE THERAPEUTIC VALUE OF ICE IN OPHTHALMIC SURGERY

Angus McGillivay, M. B., Dundee, (*The Ophthalmic Review*, September, 1894). The writer calls attention to the comparative want of attention given to cold as a therapeutic agent in modern ophthalmological text-books. "After an extensive use of cold in the treatment of ocular injuries, I have no hesitation in stating that of all remedies at our disposal, it is undoubtedly the best." He believes it is fast losing favor because it is wrongly applied, and

under such conditions, he says, it can produce disastrous results. Cold is applied early to prevent the blood vessels of an inflamed area from becoming dilated and hence to limit diapedesis and escape of plasma into the neighboring tissues; to accomplish this, applications of cold should be continuous and applied as soon as possible after the injury. "The beneficial effect of cold does not cease after the early stages of inflammation have been reached. It can be continued with great advantage, if necessary, all through the process, as can be proven by clinical experience." He regards cold as an antiseptic on account of its retarding influence in the growth of bacteria. He denies that healing is retarded and absorption of inflammatory products interfered with or that this agent becomes the source of annoyance to the patient, but claims just the opposite of these effects.

SUBCONJUNCTIVAL INJECTIONS IN THE TREATMENT OF EYE DISEASES.

William Ellery Briggs, M. D., Sacramento, Cal., (*The Journal of the A. M. A.*, September 15, 1894). The writer, having watched Drs. Darier and Abadie use conjunctival injections of mercuric chlorid solutions, became convinced that good results were obtained in a certain number of cases; he has treated quite a number of cases of which many did better than they would under other treatments alone. Most of the cases were of septic or syphilitic origin, and other treatments were used in conjunction with the subconjunctival injections. He used three to five drops of a 1:2000 solution of bichlorid, repeating the injections two or three times a week. He observed Darier's rule that where improvement was not manifest after the tenth injection, no good need be expected from this method of treatment. The cases in which he found the method to do the most good were instances of syphilitic disease of the choroid and septic ulcers of the cornea.

THE SIGNIFICANCE OF ALBUMINURIC RETINITIS IN PREGNANCY.

Robert L. Randolph, M. D., Baltimore, Md., (*Bulletin of the Johns Hopkins Hospital.* November, 1894). The writer gives the histories of five cases of albuminuric retinitis in pregnancy and calls attention to the fact that much weight should be attached to the occurrence of dimness of vision at any time during pregnancy, and that this symptom and headaches may be the only suggestions of kidney trouble. He insists upon the necessity of terminating

pregnancy at once in cases in which the retina is very markedly diseased and speaks of Howe's statistics, which show that when labor was not induced and the woman escaped a fatal issue, permanent blindness was the result. In discussing the pathology, he says: "The blindness which is present in albuminuric retinitis is due to edema of the retina and consequent interference with the conductivity of the nerve-fibers."

An analysis of his cases led to the following conclusions: "(1) Visual disturbances occurring in the first six months of pregnancy, and especially when associated with violent headaches, frequently mean albuminuric retinitis, and if this condition is found, to save sight, pregnancy should be at once terminated. (2) Visual disturbances showing themselves in the last seven weeks of pregnancy, while indicating the same retinal lesion, are of less grave import in so far as sight is concerned, and unless these disturbances are very pronounced and associated with widespread ophthalmoscopic changes, should not in themselves call for the induction of premature labor, for here, their history goes to show that sight is completely restored after labor. This is especially true when the retinitis shows itself in the last two weeks of pregnancy. (3) The occurrence of renal retinitis in one pregnancy does not mean that the woman will be likewise affected in a subsequent pregnancy, and even though headaches be present and albumen be found in the urine, so long as the fundi are free from the usual signs of an existing albuminuric retinitis, the question of sight should not properly be considered."

THE PHYSIOLOGY OF CERTAIN OCULO-MOTOR PHENOMENA WITH RESPECT TO SOME RECENT THEORIES OF ASTHENOPIA.

F. B. Eaton, M. D., Portland, Ore. (*Journal of the A. M. A.*, September 1, 1894.) The main intention of the author of this paper is to show that a number of theories of asthenopia which have appeared recently have no real foundation, either in fact or according to the established facts and principles of physiology. As illustrative of his contention, he cites the theories of "insufficiency of the oblique muscles" and of their compensatory action in oblique astigmatism, as put forth by Dr. G. C. Savage, and describes a number of experiments of Le Conte and Meissner by which the fact of a physiological rotation of the eyes outward on the visual axis during convergence, was many years ago established, this phenomenon as evoked by prisms being the basis of

Savage's theory. He also shows that the same rotation was demonstrated by Hering, Volkmann, etc. The author demonstrates by drawings illustrative of his own experiments that in case of oblique astigmatism a rotation which would harmonize the horizontal meridians would render the vertical one proportionally less so. He concludes, therefore, that: (1) The phenomena included under the term "cyclophoria" are physiological, being the results of the normal rotation ot the eyes in convergence. (2) The phenomena in no way disturb binocular vision, owing to the habitual toleration or neglect of the incoincident positions of the retinal images outside the immediate area of fixation. (3) A compensatory rotation of the eyes in cases of oblique astigmatism does not take place; if it did, it would defeat the very object for which it was invoked by the author. (4) If the laws of optics would permit the alleged correction, it would not be necessary or expedient, since it would render stereoscopic vision impossible.

The paper also criticizes the "Innervational Theory of Asthenopia" of Dr. Geo. M. Gould as being contrary to physiological facts and practical clinical experience, since physiologists agree that the relations existing between the nerve centers and muscles are not inflexible, while embryonic variations of the shape of the orbit and of the length-tension and insertions of the ocular muscles effect their innervation.

This method of prism-adduction is mainly serviceable in developing the positive portion of the relative range of convergence for distance; pushed far, it results in a true gymnastic exercise, but in many cases even where esophoria is induced, the dynamic convergence remains below the normal. In heterophorias complicated by vertical tendencies, the method is of no value, and in general it is but tentative.

THREE CASES OF STRABISMUS, WITH ANALOGOUS DIPLOPIA. AN ORIGINAL AND AN ACQUIRED FIXATION SPOT IN THE SAME EYE.

Charles Hermon Thomas, M. D., Philadelphia. (*Ophthalmic Review*, September, 1894, and *Transactions of the American Ophthalmological Society* for 1894.) Thomas recites three cases of squint in which the deviating eye possessed two fixation spots—one the normal macula, the other an acquired fixation spot; the former was ued in monocular fixation only, the latter in binocular fixation only. These three cases (two divergent squint, the third, convergent) were operated upon; the cosmetic defect was

removed, but in no case was orthophoria attained. The writer believes the following inferences to be justified by the conditions present in these three cases: (1) Binocular vision—*oeil cyclopienne*—involves an additional cerebral function above and beyond that involved in monocular vision. (2) That corresponding points of the two retinæ are in binocular fusion correlated with the functional fixation spot, whether that spot lies in the normal fovea centralis or not. (3) That suppression of the macular image during the act of binocular vision may take place, the image upon the false fixation-spot only being regarded while the macula has its usual predominance when the eye is used alone, *i. e.*, the false fixation-spot has now no longer greater prominence than a similar region of the retina in a normal eye. (4) The existence of an additional fixation-spot in strabismus is denoted when the affected eye, used alone, is seen to fix centrally and yet when, with prisms corrective of the deviation, as shown by the abolition of movement under the cover test, there occurs diplopia contrary to rule, *i. e.*, crossed diplopia associated with divergence, and *vice versa*. It will be seen that practical considerations of importance bearing upon the operative treatment of strabismus grow out of our recognition of the presence of two fixation-spots in the same eye.

AMETROPIA IN MICROSCOPIC WORK.

Capt. Charles E. Woodruff, Assistant Surgeon, U. S. A., Fort Sheridan, Ill. (*Journal of the A. M. A.*, November 24. 1894.) Capt. Woodruff does not discuss the question of asthenopia from microscopic work, but remarks that this is due to "bad light, bad position, congestion from obstructions around the neck, the habit of using the accommodation too much and unnecessarily and to other conditions, but is not due to the observer's errors of refraction." He demonstrates by drawings and by other methods of considering the optical principles of the microscope that "ametropes have clear vision in using the microscope without their correcting lenses, and that it is unfair to accuse an observer of incorrect observation because his refraction is not normal."

ABSTRACTS FROM FOREIGN CURRENT OPHTHALMOLOGICAL LITERATURE.

By Casey A. Wood, C. M., M. D.,
OF CHICAGO.

THE USE OF FORMALIN—FORMOL—IN OCULAR THERAPEUTICS. ITS EMPLOYMENT AS A PRESERVATIVE MIXTURE. RESTORATION OF QUALITATIVE PERCEPTION OF LIGHT AFTER IRIDECTOMY IN A CASE OF COMPLETE BLINDNESS FROM GLAUCOMA SIMPLEX. THE CONJUNCTIVA AS A PROTECTIVE COVERING IN EXTENSIVE WOUNDS OF THE CORNEA. THE CORNEAL SUTURE AFTER CATARACT EXTRACTION. BILATERAL, CONGENITAL PTOSIS ASSOCIATED WITH COMPLETE PARALYSIS OF ALL THE EXTERNAL OCULAR MUSCLES.

THE USE OF FORMALIN—FORMOL—IN OCULAR THERAPEUTICS.

Of all the drugs recently recommended as of value in ocular therapeutics (methylic or) *formic aldehyd* (C H_2 O) calls for special mention. Guaita, of Siena, in a preliminary communication[1] on the subject says, "that in his hands it has proved of so much value that he hopes readers of his paper may join him in experimenting with it.

The *formol*, *formalin* or *formaline* of commerce (the only shape in which it can ordinarily be obtained), is a 40 per cent aqueous solution of formic aldehyd, containing also a little methylic alcohol. It is a colorless fluid with an empyreumatic odor, of the consistence of water and miscible in all proportions with that liquid. Although not very volatile it is better to keep it in tightly closed bottles because, like aldehyds generally, it is not a staple compound and readily breaks up into paraformic aldehyd and other compounds. Pure formalin mummifies and destroys the tissues to which it is applied. Touching with it the ear of a rabbit the skin at the point of contact will, after a time, be seen to separate from the surrounding parts, some suppuration will be noticed, and the animal shows signs of pain.

[1] L. Guaita. Il formolo in oftalmojatria. Nota preventiva, *Annali di Ottalmologia*, 1894, Fasc. 5, p. 360.

O. Löw first drew attention to the antiseptic value of this substance in 1880, and in the following year Buchner and Segall confirmed the disinfectant properties of the vapor of formic aldehyd. Later formalin came to be generally known as a preservative of both animal and vegetable tissues, and in 1893 Hermann recommended it in place of alcohol, Muller's fluid, etc. for preserving the enucleated eyeball. Leber, during the recent International Congress at Edinburgh, gave it as his opinion that for this special purpose it is superior to any other method.

Those who have experimented with formalin, in special reference to its disinfecting properties, have been deterred from using it as a remedy, both because of its destructive action upon the tissues and on account of the acrid and irritating fumes that arise from it. These objections are removed when the dilute solutions are used, and especially since Stahl has shown that properly prepared, it is not poisonous.

The first to point out the possibility of its use in ocular therapeutics were Valude and Dubief in a communication to the French Ophthalmological Society. They advocated it for sterilizing the conjunctival sac in chronic conjunctivitis with purulent secretion in ophthalmia neonatorum and for the prevention of post-operative inflection. Beyond this mention of the remedy it has attracted very little attention, probably because of the large number of antiseptics recommended with a great flourish of trumpets, and found on investigation, to be of no particular value clinically. In laboratory work Guaita prefers Leber's formula. If an enucleated eye be immersed in a 10 per cent solution of formalin for twenty-four hours it will be hard enough to cut and will have retained its shape and size. Moreover, the tissues do not lose their color nor all of their transparency. This liquid is very diffusible and differs from many other preservative solutions in not coagulating albumen to any extent so that it readily penetrates to the interior of the specimen immersed in it. The same action is observed when it is applied to living tissues, and to this fact is probably due its superiority over other antiseptics. Another peculiarity of formol is the marked difference between the amount of it required to kill certain morbific germs (antisepsis), and solutions that render it impossible for them to develop (asepsis). Laboratory experiments gave the following results: A 5 per cent solution killed the cholera bacillus in three minutes, that of diphtheria in ten minutes, of carbuncle in fifteen minutes, the staphylococcus aureus in thirty minutes, and the carbuncular spores in five hours. A 1 per

cent solution took at least five hours to kill the staphylococcus aureus. As a preventative of fertilization, formol, even in very weak doses, is of signal value. According to the experiments of Trillat, Berlioz, Schmidt, and others, the smallest aseptic solution (varying somewhat with the bacteria under observation) was 1:20,000. The vapor arising from an uncorked bottle placed with a piece of meat in an inverted vessel was sufficient to delay putrefaction in the former for about a week. Pieces of fresh skin immersed in the very weakest solution absorb the antiseptic very rapidly, become "tanned," and do not decompose.

Coming to its application to the ocular tissues and its use as a remedy in diseases of the eye, Guaita has used formalin solutions to produce asepsis previous to operations, in suppurative keratitis, in granular conjunctivitis and in ophthalmia neonatorum. Solutions (distilled water only) should be recently prepared and kept in bottles fitted with a ground glass stopper. If this is not done the vapor will partly escape and partly decompose.

The best solution for irrigating the sac and for collyria is 1:2000. A solution of 1:1000 is an irritant and produces conjunctival hyperemia, while the weaker mixture is almost always readily tolerated. When the first few drops are applied a burning sensation is produced and this continues during irrigation also, but subsides immediately after the application ceases. Guaita thinks that the formol solution possesses anesthetic qualities as it appears to make the eye less sensitive to operative treatment than when the sac is irrigated with other simple fluids, such as distilled water or the physiological solution of common salt.

Comparing the condition of the conjunctival sac (previous to operation) after disinfection by various agents the writer finds that formol has much to recommend it. The experiments carried out in his own clinic were made on the evening previous to as well as a few minutes before operating on the eye. The lids and cilia are first cleansed by thoroughly rubbing them with pieces of sterilized gauze soaked in a 1 per cent solution of sodic carbonate.

The irrigating fluid is then directed upon the eyeball and into the sac from a sterilized bottle sufficiently elevated above the patient's head to give force to the stream. This is continued for four or five minutes so as to ensure complete lavage of every part of the sac.

The surface is now examined for micro-organisms as to whether the cleansing has been effective or not. In this way it was found that boric acid, salicylic acid and sublimate, (in the strength of

1:2000), gave results which are not much more satisfactory than those obtained from using sterilized water or the physiological salt solution in the same way. Immediately after lavage with the sublimate solution the sac was generally found to be sterile, but after a few hours an abundant supply of cocci appeared. This meant, probably, that the bichlorid being an irritant, stimulated secretion and exudation, thus furnishing nourishment for the infant colonies.

With formol Guaita has, so far, obtained better results, the conjunctiva remaining practically sterile (so far as pathogenic bacteria are concerned) for more than twenty-four hours after washing it out.

During and after an operation upon an eye that has been disinfected with the formol solution, there was a noticeable absence of the pain and burning which are often observed in such cases. In addition to this evidence of the anesthetic action of formalin previously noticed, the ocular surfaces were usually found to be pale, smooth and without the least trace of abnormal secretion—conditions most favorable to the maintenance of a practical asepsis.

In suppurative diseases of the cornea formol possesses the property of being more diffusible than most other antiseptics—a signal advantage in dealing with tissues deep into which micro-organisms so readily burrow, out of reach of germicidal agents. In one case in which sublimate solutions failed to put a stop to the progress of the disease, the author promptly succeeded in checking it by touching the ulcer with a 1:100 solution of formol, followed by the usual irrigations of 1:2000.

In trachoma Professor Guaita believes that from rubbing the everted lid surface with gauze sponges immersed in formol 1:400, followed by irrigation with 1:2000 every two hours he obtains, on the whole, better results than from the employment of sublimate in the same way. In two cases of pannus, suitable for treatment by jequirity, the author was able to obtain a similar reaction with formol.

Guaita has also demonstrated its value in the purulent ophthalmia of the new born. In two very severe cases (opaque corneæ with beginning ulceration, pseudo-membrane of conjunctiva, etc.,) where silver nitrate and iodoform ointment failed to act satisfactorily, formol was applied for three days in the same manner as for trachoma. The corneal ulceration was arrested, the infiltration soon decreased, and the false membrane entirely disappeared.

The author, in conclusion, hopes that his expectations regarding formol will be realized and that it will be found to be valuable both to the general and to the ophthalmic surgeon.

RESTORATION OF QUALITATIVE PERCEPTION OF LIGHT AFTER IRIDECTOMY IN A CASE OF COMPLETE BLINDNESS FROM GLAUCOMA SIMPLEX.

This is an interesting recital[1] of the case of a man, 30 years of age, who was seen by the author on August 26, 1893. He had typical glaucoma simplex in both eyes and had absolutely no perception of light. The failure of vision had commenced in one eye six weeks before and in the other two days earlier, and so rapid was the progress of the disease that both eyes became blind in three weeks. On August 27 iridectomy was done in the hope of anticipating the pains that usually came on in the blind eyes of these patients. Dr. Kugel was, however, astonished to find, on August 30, that the patient was able to perceive light, and that three days later his right eye saw hand movements, while with the left eye fingers were counted at 40 cm. During the following eight days a very sight improvement was noticed. Encouraged by his success thus far Kugel, on September 12, did a second iridectomy. On September 26, V. R. = fingers at 10 cm.; V. L. = fingers at 1 m. On November 5, when the patient left the hospital, the condition of the left eye had still further improved; V. L. = fingers at 1 m. 20 cm. The F. of V. of both eyes showed a decided contraction, more pronounced in the vertical than the horizontal meridia. The difference in the ophthalmoscopic findings before and after the operation was very pronounced. When first seen patient showed deep papillary excavation, the central vessels were pushed towards the temporal margin of the nerve and a marked bluish discoloration of the disc was readily made out. Just before leaving the hospital the vessels had resumed their normal position in the left nerve head and in the right their malposition was less noticeable. The blue apppearance of the papilla had given place to a whitish tint on the right side and to the normal coloration in the left eye. Even the excavation had almost disappeared on the left side and was not so marked on the right. Pulsation of the retinal vessels had ceased and the greatly increased tension, previously felt in both globes, had subsided.

[1] L. Kugel. Ein Fall von Rückkehr qualitativer Lichtempfindung nach Iridectomie bei Amaurosis in Folge von Glaucoma simplex. Graefe's *Archiv. für Ophthalmologie*, Bd. 40, III, 1894.

We do not usually expect to have even a faint return of light perception in blindness from glaucoma simplex, that phenomenon being reserved for the very acute forms, the so-called *glaucoma fulminans*. Moreover, cases like the foregoing are the very ones that are not commonly helped, so far as vision is concerned, by iridectomy or similar operations. It is remarkable how greatly the local lesions improved and, by no means least, how rapid was the loss of vision (fourteen days) after the attack began.

THE CONJUNCTIVA AS A PROTECTIVE COVERING IN EXTENSIVE WOUNDS OF THE CORNEA.

The writer[1] quotes Snellen as recommending a conjunctival flap for the purpose of covering wounds of the cornea and sclera, the mucous membrane being retained in its new position by sutures. This, de Wecker says, is readily accomplished where the wound is in the sclerotic and situated a distance from the corneal margin, but how can we follow Snellen's advice when the wound is in the cornea? Another objection is the friability of the conjunctiva and the likelihood of the stitches tearing through before the wound beneath is healed. To accomplish the object last named it is necessary to hold the conjunctiva in place for from six to eight days, and this is best obtained by temporary but complete conjunctival occlusion of the cornea.

de Wecker advises his plan to be used only in the case of extensive corneal injuries where one lip of the wound tends to separate from or overlap the other. In such instances we should, in addition, use slight pressure as most likely to keep the wound margins in apposition.

He carefully detaches (beginning at the sclero-corneal junction) the conjunctiva from the sclera all about the margin of the cornea as far back as the insertion of the recti muscles, including in the flap as much of the *sub-mucosa* as possible. The membrane is now reunited *across* the cornea (exercising as much pressure as is required) either with a purse string suture or by four to six vertical stitches—always remembering to include the subconjunctival tissue so as to prevent the stitches from being torn out.

In this way the cornea is entirely covered up and the palpebral edges and cilia having been thoroughly disinfected a bandage is applied and for eight or ten days, during which time the suture threads, themselves thoroughly disinfected, become detached spontaneously.

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[1] de Wecker. Traitement des blessures de la cornée par l'occlusion conjunctivale. *Annales d'oculistique*, November, 1894, p. 293.

The operator who makes use of this procedure for the first time may, perhaps, feel uneasy as to the outcome of the operation, but he may be assured that the conjunctiva will be certain to detach itself once more from the cornea except at the line of the wound—just where it is required.

In this manner many eyes, apparently doomed to destruction on account of very large penetrating injuries, may be saved. The patient should be anesthetized and the plan above laid down followed as soon after the accident as possible—without paying much attention to deeper lesions, such as traumatic cataract or luxation of the lens. These can be treated subsequently. Subsequent keratoscopic examinations will usually show how slightly the corneal curve has been affected in cases where this method has been applied.

The author has derived signal benefit from this drawing over of the conjunctiva in conjunction with partial ablation of staphyloma anterius. Here the conjunctiva adheres only at the cut margins of the staphyloma. The translucent mucosa permits not only a slow filtration of interior fluids from the eye, thus relieving the glaucomatous tension so often present in these cases, but it also acts as a sort of artificial pupil.

This temporary conjunctival occlusion has to recommend it facility of execution; it is not subsequently painful and it leaves no trace of the operation upon the globe.

THE CORNEAL SUTURE AFTER CATARACT EXTRACTION.

In the last number of Knapp's *Archives of Ophthalmology* there is an admirable translation by the senior editor of a contribution to the *Archives* by Dr. Kalt. Practically the same paper[1] was published in Paris with a few additional sentences that did not appear in the English journal. As they form a part of the argument, *pro*, I quote them, as follows: "One objection often raised is this: 'Your suture complicates an operation that is otherwise beautifully simple.' No doubt! It takes two or three minutes to put in the stitch and to sew up the wound, but how about the dangers that are thereby avoided? While every conscientious surgeon exposes his patient to the fewest risks possible, we oculists still persist in abandoning our large corneal wounds to the mere chance of an intraocular hyper-secretion. I conclude with the

[1] De la suture cornéene après l'extraction de la cataracte. *Archives d'ophtalmologie*, October, 1894, p. 639.

words of a most excellent surgeon, but one little versed in ophthalmology. I had just completed, in his presence, an operation for cataract. I asked him if it did not appear strange to him to see me stitch the corneal incision, contrary to all the ordinary methods. 'Not at all,' said he, 'it appears quite natural to me; you have made a wound and you close it up. Anything extraordinary about that?' "

BILATERAL, CONGENITAL PTOSIS, ASSOCIATED WITH COMPLETE PARALYSIS OF ALL THE EXTERNAL OCULAR MUSCLES.

This rather rare condition of the ocular apparatus is well illustrated in the following case-history:[1] S. K., boy, 15 years of age, had always been healthy and strong. His upper lids had drooped since infancy and appeared to become thick and swollen as he grew older.

The left interpalpebral fissure measures only 2 mm. at its widest part: the right, 5 mm. The left lid covers the whole of the pupil, only a small portion of the iris being exposed. On the right side a segment of the pupillary area 1 mm. wide is seen. If the right eye be closed the patient can see a little by tilting the head backwards and drawing up the skin of the forehead as high as possible, but in spite of these exertions the lids cannot be raised to any extent. V. = $\frac{6}{6}$ u. o., and J. I. easily. Fundi normal; direct and consensual pupillary reaction good. The left eye is slightly divergent. The excursion of both bulbs is almost completely abolished; it is only with the greatest exertion that the eyeballs can be rotated a degree or two in any direction. In attempts to read, the patient makes use of his right eye only.

The following operation (after Birnbacher) was performed in this case: An incision, corresponding to the upper convex border of the tarsus, was made through the palpebral skin the whole length of the upper lid. After the removal of the subcutaneous fat, which in this instance was considerable, an oval piece of superfluous skin was also excised. The upper border of the tarsal cartilage having been laid bare, three strong double-needled threads were passed through it (one in the center of the wound, each of the others on either side, 7 mm. from it) and securely knotted. Each of the six needles was then pushed up under the skin to the eyebrow, where they emerged at regular inter-

[1] G. Ahlström. Doppelseitige kongenitale Ptosis und Unbeweglichkeit der Bulbi. Deutschmann's *Beitraege zur Augenheilkunde*, XVI Heft, 1894, p. 51

vals. By carefully pulling upon these threads the tarsus and lid were sufficiently elevated and the threads tied in pairs over three pieces of small-sized drainage tubing. A couple of superficial stitches brought the edges of the skin wound together. The deep sutures were allowed to remain *in situ* for seventeen days. The ptosis was now fully corrected and there has so far been no relapse. Through his frontalis muscle the patient has considerable control over his upper lids, the explanation of which lies in the fact that one can readily feel on each side thick and broad cicatricial bands stretching from the eyebrow to the upper edge of the tarsus.

The writer thinks the central lesion in this case extends from the posterior part of the third ventricle, along the sylvian aqueduct to the parts beneath the fourth ventricle.

The patient did not complain of diplopia after the operation, nor can double images be readily induced by the usual methods. In doing near work he invariably fixes with the right eye and when it is closed he turns his head toward the right to bring the left eye into a position where he can fix the object.

A CASE OF ACUTE PURULENT INFLAMMATION OF MIDDLE EAR WITH TWO ATTACKS OF DOUBLE OPTIC NEURITIS, NO MASTOID COMPLICATION, FREQUENT DELIRIUM, TWO OPERATIONS AND RECOVERY.

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IT seems to me that all interesting otitic cases of value such as I am about to relate should be reported, so that all new signs, phenomena, etc., may be noted and be of value to some one in making up intelligent diagnoses of cases, for it is only by a summary of such collective investigations that we arrive at definite conclusions.

With this end in view, I present the following history of a very interesting case:

Miss E. F., a domestic in my own family, while visiting her friend on October 29, 1892, slept in a cold room which she was not accustomed to doing, and contracted a severe acute rhinitis, which I treated with apparent success, but on Sunday, November 14, 1892, an acute inflammation of left middle ear set in with intense pain, which was not alleviated even after puncturing the tympanic membrane on November 20th, and giving vent to considerable pus, but continued every night and most of the day, necessitating the use of narcotics for about five weeks, up to the time of the first operation.

During this time the continuous use of hot boric acid solutions with insufflations of boric acid, thoroughly cleansing the parts several times a day was kept up, but all without avail, the pain was constant, as well as a continuous profuse purulent discharge, notwithstanding the daily use of the Eustachian catheter to thoroughly keep clear the Eustachian tube and tympanic cavity of the constantly forming purulent discharge. Her H. D. = ordinary voice at three feet only in this ear. She now began to have numerous attacks of inflammation of the auditory canal, which generally yielded to the application of oxid of zinc ointment, and was no doubt due to the constant purulent discharge. December 20th, she began to complain of vertigo, stiffness of the muscles of her neck, partial paralysis of left side of face, difficulty of swallowing, stiff tongue, pain in pharynx, and impaired sensation of taste. Pulse ranging from 90 to 120, temperature 99° and

occasionally subnormal, and at no time above 99.5°. Delirium now began to be a daily symptom lasting from ten to fifteen minutes at a time, with intervals of an hour or two when she was rational. December 23d, her vision now began to fail her in each eye. During a rational interval I took her distant vision which equalled $\frac{8}{200}$ in each eye. Diplopia was a frequent symptom although not constant. The ophthalmoscope showed both optic discs swollen to the extent of 3 D.; their outlines were not discernible in the least. Pain in both ears excruciating, also in region of cerebellum, sensation of falling backwards, some tenderness along veins of neck, right ear also began discharging freely, but soon subsided under the use of hot boric acid injections. There seemed to be a great deal of tenderness over left mastoid region, but without any inflamed or edematous condition. Taking into consideration all these symptoms an operation seemed inevitable, or death would soon be the end of my patient.

On Sunday, December 25th, I removed her to the hospital where, after a consultation, and by the assistance of Drs. Funk, Coover, Gorgas, Ellenberger and James, I decided to open the mastoid process, and do such other exploratory operative procedures as would be deemed necessary. After using thorough antiseptic measures the mastoid was laid bare, but as it appeared so very healthy I concluded to use one of Buck's drills first for exploratory purposes, and then if necessary do the Schwartze operation. After drilling into the antrum I found no pus there, but everything in a healthy condition, when suddenly an immense quantity of pus flowed from the auditory canal which had been previously thoroughly dried out. There was apparently no discharge the entire day preceding the operation. Taking into consideration the healthy condition of the parts, and the profuse flow of pus through the auditory canal, I decided not to proceed any further with the operation. The wound was packed with iodoform gauze, carefully bandaged, and I decided to wait for further developments. Her temperature was 99° before the operation and 98° an hour afterwards.

The pain in the ear through the temporal region and at the base of the brain ceased gradually. The wound was dressed after forty-eight hours and regularly every three or four days for three weeks, the entire time she was in the hospital. She was given 10 grains of potassium iodid three times a day for the optic neuritis, and when she left the hospital at the end of the third week feeling perfectly comfortable, her vision equalled $\frac{15}{20}$ partially in each eye. She returned to my residence and began her regular domestic work, and for almost a year was perfectly comfortable except an occasional attack of pain followed by a very offensive discharge of pus. During December, 1893, up to February, 1894, she had a continuous purulent discharge with frequent attacks of a very intractable inflammation of the auditory canal, resulting in several attacks of erysipelatous inflammation which extended over her entire face. The powdered oxid of zinc applied frequently, the erysipelas soon subsided.

She suffered intense pain during the entire three months in the back of her head, in the left ear (the same one I had operated on), and through the temporal region. The second attack of optic neuritis now began to such an extent that her vision diminished to $\frac{15}{100}$ in each eye. Several attacks of delirum followed by coma, lasting from ten to fifteen minutes at a time; subnormal temperature, ranging between 97° and 98°. Profuse

purulent discharge and diplopia were urgent symptoms which to me seemed to indicate a second operation.

On February 12th, I again removed her to the hospital with the determination to clean out the entire middle ear or whatever seemed necessary to effect recovery if possible. Under ether I thoroughly curetted the tympanic cavity, removing the incus and malleus which were carious and easily removed. At several places the temporal bone was denuded, but after packing it with equal parts of iodoform and boric acid for several days the discharge entirely ceased. I kept my patient lying on her left side so as to favor drainage as much as possible, and in one week's time pain had ceased, the delirium gone, and she was again ready to return to her work as one of my domestics.

I put her on iodid of potassium and strychnin for about two months which gradually improved her optic neuritis and vision to $\frac{5}{30}$ for a while, but subsequently diminished to $\frac{5}{60}$ in right eye and $\frac{5}{70}$ in left eye.

Her vision at this writing remains at that; she has had no pain or purulent discharge from either ear since the operation.

Both optic discs appear quite pale, which is, no doubt, a sequela of the two attacks of optic neuritis. It is now ten months since the operation and she is in better health now than she had been in two years.

H. D., R. E., $= \frac{2}{40}$; H. D., L. E., watch on contact only. R. E., H. D., = ordinary voice at 20 feet; L. E., H. D., = ordinary conversation at 8 feet.

In looking up the literature upon this subject I find that Dr. Charles J. Kipp, of Newark, N. J., reports a case to the American Otological Society in 1892, which in very many respects is like mine, yet it differs from mine considerable. His patient had good vision during and after the attack of optic neuritis, my case did not have good vision, and in addition had diplopia with the second attack, and has finally resulted in some general atrophy. The mastoid in his case was not tender upon pressure and contained foul pus, while my case was very tender upon pressure, but contained no pus.

The optic neuritis in Dr. Kipp's case began six weeks after he first seen the case, and in my case it began five weeks after the ear trouble began. There seems to be no appreciable difference in the temperature records of our cases. Cases of optic neuritis are rare that occur within four to six months in acute or chronic cases, and I can find none on record except Dr. Kipp's case. I have never seen or read of a case of acute or chronic suppuration of the middle ear accompanied by two attacks of optic neuritis. A marked symptom in this case was the continued delirium during an entire week preceding the first operation, and for almost two weeks preceding the second one. She quite frequently would get up out of bed at night and then fall into a stupor requiring quite an effort to arouse her. The pain seemed incessant.

I never saw a case that suffered such intense and constant pain as this one. It seems to me there is no doubt that the septic matter was conducted by the blood vessels running from the middle ear (a phlebitis of diploetic veins), directly to the parts affected. Did the first operation indirectly cause the profuse flow of pus through the auditory canal? I think it did.

It seems to have had a revulsive effect upon the middle ear, and my patient undoubtedly improved immediately after the operation.

Dr. Allen[1] says: "We frequently meet with acute cases where the operation, even when made under proper indications, reveals a perfectly healthy bone. This should, however, never prevent us from making an exploratory opening into the antrum and cells, as the effect on the patient of operating on the bone (under thorough asepsis) is little greater than that arising from the periosteal incision, and at the same time the operation exercises a certain revulsive effect on the middle ear suppuration." In a similar case hereafter, I would first thoroughly curette and clean out the middle ear.

Had I done that at first, a second operation I have no doubt would not have been necessary. This case seems to show the necessity of first curetting and thoroughly establishing drainage through the middle ear in suspected cases of cerebral complications before opening the mastoid or skull proper. Under similar circumstances, I think most any surgeon would have done just as I did. As a question of diagnosis, we all thought it one of mastoid complication and septic infection, with a possible cerebral abscess or sinus thrombosis. If it was not a case of direct septic infection I am unable to diagnose it. In support of our opinions I present the following references:

Oliver & Cleveland[2] says, "That optic neuritis is to be considered positive evidence that the inflammatory process has invaded the cranial cavity."

Politzer[3] says, "that septic material in some cases is carried into the circulation direct from the cavities of the temporal bone."

Heiman,[4] of Warsaw, says: "Abscesses are rare after acute inflammation of the middle ear, and mostly develop in case of chronic otorrhœa."

The same author[5] says: "optic neuritis and paralysis of the extremities may be noticed in suppurative otitis, and that the differentiation of an otitic brain abscess from otitis media suppurativa is often difficult, as many general brain symptoms may be produced by an otitis. He believes that the difficulty in diagnosis

is not so because an aural suppuration runs a course simulating that of brain abscess, but that brain abscess in some stages may not reveal itself, and may show only such symptoms as may be attributed to the existing aural inflammation." To show the rarity of cases of optic neuritis from direct septic infection from the tympanic cavity, the following cases go to show that they are most always due to other cerebral complications:

Edmunds[6] shows that of twenty cases, thrombosis, meningitis, temporosphenoidal abscess, cerebellar abscess; fifteen had either single or double optic neuritis.

Patterson[7] reports twenty-five cases of pappillitis, but all from brain abscess and sinus thrombosis.

Ballance[8] reports a number of cases from sinus phlebitis.

Ferrier,[9] Parker,[10] Barr,[11] Greenfield,[12] report all their cases due to cerebral abscess and sinus thrombosis.

Kellar[13] noticed abducens paralysis in one or two cases.

Kipp[14] and Pomeroy[15] report three cases of purulent iridochroiditis supposed to be due to septic emboli carried from ear into the choroidal vessels.

CONCLUSIONS.

This case demonstrates the following conclusive remarks:

1. We may have optic neuritis in the early stages of acute purulent inflammation of the middle ear, and that the ophthalmoscope should be used in all acute and chronic cases of otitis media.

2. That symptoms simulating cerebral abscess and sinus thrombosis may be produced by direct septic infection from the middle ear.

3. That one should establish thorough drainage in all acute cases, and that if after the acute symptoms have subsided, and all treatment of no avail, and the purulent discharge is not arrested, curette the tympanic cavity, and in most cases you prevent further infection.

4. That when you have symptoms simulating cerebral abscess, etc., as in this case, errors of diagnosis are liable to occur, and as a precautionary measure, first curette and clean out all carious and necrosed ossicles, and diseased adventitious matter, and you may not need any further operative measures. When curetting, etc., of the tympanic cavity does not arrest the discharge, and you still have cerebral complications, open the mastoid regardless of it being tender upon pressure or not, and if this is still of no avail, then open the skull as per indication of symptoms.

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THE INFLUENCE OF AFFECTIONS OF THE UPPER AIR-TRACT UPON THE EAR.

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ONE may believe a certain idea to be correct, but unless he adduces firmly established facts in its support he can hardly hope to gain the adherence of other investigators to his belief. The old saw that nothing lies so much as figures, except it be facts, has become so trite an argument against statistical productions that one is apt to lose sight of the other saying in regard to the choice of the lesser of two evils, and certainly as between impressions and an attempt at reasoning from facts the choice is not difficult. Light is vouchsafed to genius occasionally as the result of impressions, but for the average observer deductions from facts prove the better and surer road. There is a well defined opinion pervading the otological world that a great many aural troubles are either the result of or aggravated by pre-existing nasal or naso-pharyngeal diseases. With certain affections, *e. g.*, adenoids, etc., this is demonstrably true. How far it is true in regard to the less well-marked affections, this article is an attempt at answering. The following assertions are based upon the examination of about five hundred dispensary aural patients, by both anterior and posterior rhinoscopy, made at one sitting, the probe and cocain being employed to supplement the vision in all doubtful cases.

Out of 72 cases of *ceruminous impaction*, only 5 had nose, naso-pharynx and pharynx all normal, 22 had structurally normal nasal chambers, but more or less trouble with the naso-pharynx or pharynx, 9 suffering from coryza; in 3 other cases the naso-pharynx and pharynx were normal, the nose alone being involved. The 42 cases remaining had well marked naso-pharyngeal processes.

In 12 cases of *otitis externa acuta*, the entire tract was normal in 5, one other having adenoids only, another coryza and a third a history of injury from sea bathing. The 5 cases left were pathological.

Forty-three cases of *tubal obstruction and catarrh* showed only 1 case with the naso-pharyngeal passages normal; 28 had structurally normal nasal passages; 15, however, having coryza, while 20 had structural changes in the naso-pharynx (adenoids, enlarged tonsils, etc.), the remaining cases, except the one normal case above mentioned, having some local disease (hypertrophy, atrophy, etc.); 8 of the cases with normal nasal passages had previously been victims of whooping-cough, measles, scarlet fever, or diphtheria, 7 at the same time having adenoids, together with coryza in 3. In the 15 cases remaining with decided nasal disease, 10 had adenoids, 4 of whom were survivors of scarlet fever, measles, or whooping-cough.

In 19 cases of *otitis media catarrhalis subacuta*, 2 possessed normal naso-pharyngeal cavities, 7 had structurally normal nasal passages, but were suffering from coryza, 1 also giving history of trouble from sea bathing; naso-pharyngeal affections existed in the 10 remaining cases coincident with acute rhinitis in 4 and sea bathing in 1.

The examination of 16 cases of *otitis media catarrhalis acuta* showed only 1 case with a normal naso-pharyngeal tract, the nose being structurally normal in 8, these, however, all having coryza, with whooping-cough in 1; 1 case, otherwise normal, had adenoids; 6 cases had evident naso-pharyngeal lesions, with adenoids in 1 case.

Of 48 cases of *otitis media purulenta acuta*, 21 were with noses structurally normal, 5 of these having a normal naso-pharynx also, the rest with coryza, in 1 case combined with injury from sea bathing—none of these cases had previously had any constitutional disease; the 27 cases with abnormal nasal passages had present acute coryza in 10 cases, with sea bathing in 1 and the snuffing of water in 2 (none of these last having had any constitutional disease previously), 5 of the remaining cases had recovered from scarlet fever, measles or diphtheria.

There was no normal naso-pharyngeal tract in 20 cases of *otitis media purulenta recurrens*, though 6 were structurally normal as to the nose and 4 as to the naso-pharynx, these not occurring in the same persons, 2 of the former having coryza; 14 cases had well marked nasal disease, together with sea bathing in 1, measles in 2 and coryza in 8.

In 83 cases of *otitis media purulenta chronica* there were 9 perfectly normal naso-pharyngeal cavities without the history of any pre-existing constitutional disease; 20 cases with structurally

normal nasal passages, 9 also having coryza, 4 of the 20 having normal naso-pharynxes, but these 4, with 3 of the others, having previously had either measles or scarlet fever; 54 cases had nasal trouble, the naso-pharynx being normal in 9, coryza co-existed in 6, 18 gave constitutional disease as the cause, 2 sea bathing, in one combined with adenoids, in the other with influenza.

Only 1 case with perfectly normal naso-pharyngeal tract could be found in 31 cases of *otitis media purulenta residuosa*, 10 others having structurally normal nasal passages, but afflicted with coryza in 3, and with a history of measles or scarlet fever in 4; 20 cases had pathological conditions present, 4 giving history of pre-existing constitutional disease.

In 28 cases of *otitis media chronica catarrhalis* the nose and nasal pharynx were normal in 3, one of whom had recently had the influenza; in 5 other cases with structurally normal noses, 2 had coryza, 1 typhoid fever and diphtheria and 1 influenza; the 20 remaining cases having nasal disease had normal naso-pharynxes in only 3 cases, 7 had or were subject to coryza, none had previously any constitutional trouble.

Of 74 cases of *otitis media et interna*, 9 had normal naso-pharyngeal cavities, one of these attributing the trouble to pregnancy, another to scarlet fever and one to measles; in 18 cases structurally normal nasal passages co-existed with either abnormal naso-pharynxes or acute coryza or both, 5 cases also having previously had constitutional complaints that might have been causative; the 47 cases with nasal disease showed 8 with normal naso-pharynxes and 4 with histories of constitutional disease (syphilis, etc.).

In 42 cases of *otitis interna* there were 6 cases with perfectly normal naso-pharyngeal cavities, 1 with coryza only and 3 with the naso-pharynx slightly affected only; there were 32 cases, mostly of slightly marked nasal disease, 7 of these having normal naso-pharynxes, 5 coryza and 4 with constitutional disease capable of producing the lesion.

CONCLUSIONS.

Ceruminous impaction. In 33% the naso-pharyngeal tract was not sufficiently involved to excite reflex irritation, in 66% the irritation may have been a factor, while in 40% of these it was probably influential.

Otitis externa acuta. In only 16% was it possible that the naso-pharyngeal processes could have exerted any effect.

Tubal obstruction or catarrh. Showed only 2% existing independently of naso-pharyngeal trouble; 88% were surely the result of naso-pharyngeal disease and 10% partly.

Otitis media catarrhalis subacuta. In 16% no naso-pharyngeal influence could be traced; 58% were surely and 26% probably in part due to naso-pharyngeal disease.

Otitis media catarrhalis acuta. No visible naso-pharyngeal cause in 6%, certainly causative in 81% and probably in part in 10%.

Otitis media purulenta acuta. The naso-pharyngeal disease was not sufficient in 10% to cause the aural complaint; 50% were due to naso-pharyngeal disease alone, 21% partly due to it, and 19% were produced by other causes entirely.

Otitis media purulenta recurrens. In 60% the naso-pharyngeal condition was directly responsible.

Otitis media purulenta chronica. Eleven per cent showed no naso-pharyngeal irritation, 35% were directly due to naso-pharyngeal influences, 30% to contagious diseases principally, 24% being partly due to naso-pharyngeal influences.

Otitis media purulenta residuosa. Sixteen per cent were free from naso-pharyngeal causation, 42% were caused by naso-pharyngeal disease, 29% were probably partly due to naso-pharyngeal disease, and 13% were probably not influenced by the naso-pharyngeal condition.

Otitis media catarrhalis chronica. No naso-pharyngeal trouble in 18%, 57% almost certainly caused by it and 25% partly.

Otitis interna et media. Twenty-six per cent were mainly due to other causes, the naso-pharynx was partly to blame in 36%, and in 38% the effect was doubtful.

Otitis interna. Twenty-five per cent could have no bearing upon the ear trouble, and only 14% had sufficient naso-pharyngeal trouble to have rendered possible any extension to the middle ear and beyond.

The more marked ear trouble existed upon the same side as most of the naso-pharyngeal disease in 91 cases, and upon the opposite side in 70 cases. In 47 cases the naso-pharynx was normal. Both sides of the naso-pharyngeal cavities were affected, only one ear being involved in 115 cases. Both ears equally involved, one side of naso-pharynx more than the other, in 47 cases.

Thus we see that in external ear troubles, especially cerumen, the condition of the naso-pharynx has a slight influence; in

middle ear affections the condition of the naso-pharynx exerts a great influence upon the aural processes (being directly causative in from 35% to 88% and partly in from 10% to 29%), in otitis media et interna the naso-pharynx was partly to blame in 36%, in otitis interna only 14% could possibly have exerted any influence. The special bearing of greater involvment of either side of the naso-pharyngeal cavities seems not to be of much importance as to its influence on the corresponding ear.

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TUBERCULOSIS OF THE TEMPORAL BONE. EXTENSION OF THE TUBERCULAR INFLAMMATION TO THE BASE OF THE TEMPORO-SPHENOIDAL LOBE.

By Otto Koerner, M. D.
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Translated and condensed by H. A. Alderton, M. D., Brooklyn, N. Y.

POST MORTEM in tuberculous patients one not seldom finds meningeal and brain tuberculosis in the neighborhood of tuberculous destruction of the temporal bone. They generally occur simultaneously with deposits elsewhere, it being often impossible to locate the primary lesion.

In other cases, the infection of the skull-contents apparently is consequent upon disease of the temporal bone, as when the carotid canal is exposed by destruction of bone, the walls of the artery affected, and the germs of miliary tuberculosis are only distributed in the district supplied by the arteries of the Silvian fossa. This contention is assured, when no other colony, that could be answerable for the infection of the pia, can be found in the body outside of the tuberculosis of the temporal bone. Should the bone disease extend to the sinus or the upper part of the bulbus jugularis, the tubercular germs may be scattered throughout the body by the veins. They attack, for the most part, the lungs, and in no such case, to my knowledge, has the tubercle been found in the pia or in the brain.

The extension of the tuberculosis of the temporal bone to the neighboring parts of the brain through contact, without the mediation of the large vessels, seems seldom to occur. I found only two such cases in literature, and I therefore report one of my own. Evidently the reason of this rarity of origin is that in temporal tuberculosis the air soon gains entrance through the ear and leads to a mixed infection which more quickly and easily produces purulent than tubercular infection of the brain and its adnexa, a fatal result taking place before brain tuberculosis has time to develop.

A Chinaman, 18 years of age, family presumably, and himself hitherto, healthy, attacked, without known cause, by pain in right ear in June, 1892; this decreased eight days later incidentally with a copious discharge of pus. Suppuration continued until the end of July when the mastoid region became swollen. I first saw the patient August 1, 1892. The swelling covered the whole mastoid, pressed out the auricle, and markedly fluctuated. Canal greatly narrowed by bulging posterior-superior wall, pus odorless. Normal temperature. Operated August 2, 1892. A fistula was found in the fossa of Bezold leading in a long softened bone to a cavity filled with granulations and bone fragments.

The antrum contained granulations.

Posteriorly the sinus transversus was found exposed for about 1 cm. and seemed normal. Syringed with sublimate solution, dusted iodoform, and applied gauze. Iodoform dressings regularly, but no healing occurred. The swelling in the meatus was repeatedly incised. November 9th, investigated cavity and found that the bone was still further involved in all directions, and this was removed. December 27th, removed still more unhealthy bone, laying bare the sinus, now covered with granulations, to a still greater extent. In spite of this the disease advanced. The bone deep in did not granulate. Towards the end of February, 1893, an abscess of the mastoid apex was opened by enlarging downwards the wound opening. On November 2, 1893, two pea-sized sequestra were extracted, followed immediately by vomiting, dizziness and facial paralysis. Four days later, upon removal of a third sequestrum, there occurred convulsions of the right half of the face and the facial paralysis became more marked.

The patient was remarkably long in coming out from the short and not deep anesthesia, had a few convulsions in the right leg and both hands, and was apathetic for the day.

Temperature, p. m., 38.5 C. Next few days no fever.

Patient then entered an institution and when I again saw him, the spring of 1894, was extremely emaciated and coughed. Complete facial paralysis. Operation: wound in same condition. The pus pulsated in the region of the sinus P. M. temperature 37.8 C. to 38.4 C. Bilateral apex infiltration of the lungs. No expectoration. It was not thought advisable to operate again.

In May, 1894, a. m. temperature 36-37 C.; p. m. temperature 38-38.5 C. Vomiting almost daily. May 25th, p. m., a heavy chill followed by fever of 39.2 C. A second chill May 29th, p. m. temperature rising to 40 C.: May 30th, a. m. sank to 35.2 C.; at

midday, after another chill, rose to 40.7 C.; evening 39.1 C., and on May 31st, a. m. 35.9 C. Chills on June 7th, 9th and 15th, with somewhat irregular fever between. Strength rapidly disappeared, frequent vomiting, slight cough, extremely little mucus expectoration, Pulse regular and about 100. A sensitive, swollen gland appeared under the angle of the lower jaw. He complained only of great weakness and frequent occipital headache. Occasional drowsiness in the beginning of July. July 9th, a chill. A painful, hard swelling extended from the angle of jaw to the middle of neck. Increased drowsiness; death July 31st.

Autopsy: Great emaciation. Considerable clear fluid in pericardium: Pleura adherent at pulmonary apices. In both superior lobes, small bean-sized cavities, peribronchitic indurations, and a few miliary tubercles. Spleen swollen. Isolated tubercles in kidneys. Brain, in taking out was torn over the right tegmen tympani. The attached portion to the tegmen measured about 4 cm. broad and long and 1-1½ cm. thick, a corresponding excavation existing upon the base of the temporo-sphenoidal lobe, extending up into the white matter. A thrombosed vein of the pia extended posteriorly from this defect and was bathed in pus. In both, especially the left, Silvian fissures were countless tubercles on the pia. Both lateral ventricles were slightly distended by clear fluid. Otherwise the cerebrum and cerebellum were normal. The sigmoid portion of the transverse sinus contained pus. The superior petrosal sinus was thrombotic. The whole sigmoid fossa of the sulcus transversus was destroyed by caries and the sinus, covered with pale, firm granulations, projected deep into the destroyed bone. The tegmen tympani was largely destroyed. The dura is here much thickened, covered externally with granulations, in which are imbedded countless bone fragments. In a similar manner, the above mentioned piece of brain substance was adherent to the dura internally, the uniting mass of granulation tissue being strewn throughout with hemp-seed to pea-sized cheesy nodules. Mastoid process, canal, and tympanum form one great cavity filled with granulations and bone fragments, and the facial canal, cochlea, one part of the semi-circular canal, the fossa jugularis, and the lateral wall of the carotid canal are almost completely gone. The destruction was sharply limited to the temporal bone.

After removal of a pigeon egg-sized gland at the angle of the inferior maxilla, the jugular was exposed. It was filled with pus above, in the middle of the throat completely destroyed, and lost itself here in a somewhat hen-egg-sized abscess.

ON CHOLESTEATOMA OF THE EAR.

By Dr. B. Baginsky.

Berl. Klin. Woch., Nos. 26-27, 1894.

Translated and abridged by George Morgenthau, M. D., of Chicago.

The following views of the origin of cholesteatoma have been presented:

1. Virchow's, that cholesteatoma are heteroplastic tumors, and occur only as such.

2. The opinion shared by many aurists, and also some pathologists, that cholesteatoma are so-called retention products.

3. The dualistic interpretation according to which both are possible.

Cholesteatoma must be accurately defined.

Virchow demanded that a distinction be made between simple processes, *i. e.*, those in which cholesteatoma-like masses are shed; and those which are "true" cholesteatoma pathologically, *i. e.*, tumors with a delicate membranous envelope, epidermoidal formations and cholestearin contents. Lack of discrimination between the clinically observed products, and tumors found post-mortem appears to the author to be the main obstacle to reconciling these opinions. And from this point of view it becomes clear how the disharmony has increased in course of time. The author cannot doubt the occurrence of cholesteatoma as primary genuine tumors in the petrous bone, deferring to Virchow's specimens and the reports of post-mortem examinations published by many aurists. But this does not prove that Virchow's exclusive explanation is the only correct one.

The pathologist often meets with such processes when they are so far advanced and spread that he cannot distinguish between cause and effect. And it is not impossible and does not run counter to our accepted ideas, that different pathological processes result in the same or at least very similar products. It behooves us, therefore, to examine if those epidermoidal lamellæ which we get on irrigating suppurating ears and which we call cholesteatoma, are absolutely identical with the true V. C. found as tumors in post mortems. On regarding the products but superficially, both do appear very similar, but they are not identical.

The smaller lamellary masses, obtained by syringing, lack that external delicate membranous envelope (described by Virchow), which lines the bony cavities. Furthermore, in true cholesteatoma the central nucleus of pus (Eiterkern) (of which Von Troeltsch speaks) can hardly be found. Softened spots often occur in cholesteatoma, as is well-known, but these are not purulent masses which are centrally located and have become thickened, but are due to degeneration of the centrally located cholesteatoma cells. Wendt's theory as to the causative influence of an desquamative inflammation in the formation of cholesteatoma cannot be sustained either, because it does not explain the formation of an external membranous envelope and all the other conditions which constitute cholesteatoma.

Politzer describes nodules of epithelium as cholesteatoma, with which a more accurate contemplation cannot connect them. In Lucae's cases of granulation tumors with cholesteatoma, we are dealing with metaplastic processes of the surface epithelium, a sort of pachydermia which is not so rare in granulations; the lamellæ-like formations cover the granulations, and can be lifted from them rather easily. Microscopically only epithelial elements are found, and but little cholestearin; a membranous envelope has never been demonstrated, so that these formations should not be called cholesteatoma in the pathological sense. Habermann and Bezold advance the theory that cholesteatoma grow from without inwards, the epidermis extending through the perforated membrane into the antrum. Bezold does not accept this since Habermann too admits the existence of primary cholesteatoma in the petrous bone, it appears more probable that the epidermis of the cholesteatoma of the petrous or mastoid bone grows into the tympanic cavity, that the process extends from within outwards. The primary cholesteatoma of the antrum would, then, extend by the quickest and easiest way, that is through the "flaccid membrane" into the tympanum, and here cause inflammation with formation of epidermoidal products. So-called artificial cholesteatoma of Panse and Grünert cannot be adduced as proofs as the pathological examination shows them to have been cholesteatomatous masses. These cholesteatomata are produced by the extension of epidermis by the way of the canal made in a former perforation of the mastoid process and kept patent by a lead nail. Panse thinks these are cases of unintentional but successful implantations of cholesteatoma. The exact pathological examinations are lacking, and therefore, the cases cannot be adduced in proof of the theory. In

consideration of the persisting contradictions in explaining the origin of cholesteatoma and the difficulties encountered, recognizing the developmental stage of pathological processes from products already complete, the author attempts to clear up the matter through bedside observation and clinical results.

How then does the primary genuine cholesteatoma of the petrous bone present itself? Experience demonstrates that no specific symptoms need appear *intra vitam* which would point to cholesteatoma. Inflammatory signs of any kind on the tympanic membrane, in the antrum cavity, etc., may be absent; hearing is normal or at least not greatly impaired, and often the diagnosis is made many years later when the process, without suppuration or other inflammatory processes, breaks to the surface either through the mastoid or into the external meatus. Cases of this kind have been found by chance at post mortems and would undoubtedly increase in number if the temporal bone were examined more frequently. It must be, however, conceded that these cholesteatomata without symptoms are rare compared to the second kind which appear as chronic middle ear suppurations complicated with cholesteatoma or cholesteatomatous products. In this otitis media purulenta with perforation of the drum-membrane and granulation-tumors in the drum-cavity, cholesteatomatous products can be often removed in greater or smaller masses by syringing. There is, therefore, an undoubted relation between middle ear suppuration and such cholesteatomatous products. And Lucae believed he brought proofs that we are dealing with epidermis which is newly formed in otitis media purulent granulosa while the older strata are shed and retained in the cavities of the middle ear.

These chronic middle ear suppurations may be divided into two kinds which may, to be sure, occur together:

1. Suppurations of the tympanic cavity with granulations, and perforations in different parts of the membrane; often with complete loss of the membrane.

2. Suppurations of the cavity at the upper pole of the membrane with perforation of Shrapnell's membrane, through which whitish-grey lamellar cholesteatomatous products bulge into the external canal. In both forms caries can generally be demonstrated.

In the first group, the diagnosis "cholesteatoma," based solely on these epidermoidal lamellar products cannot, path-anatomically speaking, be sustained; certain characteristics of genuine cholesteatoma are wanting as we showed above, and it is known that similar products result from desquamative inflammations of the

cavity. Both parties may claim this field of discussion if they agree upon speaking of cholesteatoma wherever they meet with these epidermoidal formations. But they are not, in justice to the path-anatomical definition. The question also arises why these cholesteatomatous products result in these middle ear suppurations while metaplasia of the kind is not found in apparently identical diseases? An answer is impossible. In any case, however, these are not true neoplasms. In the second group the conditions are somewhat more complicated, and often can only be interpreted after the bony cavities have been brought to view by operation. There are chronic middle ear suppurations with perforation of Shrapnell's membrane in which peculiar secretory products of an epithelial nature appear, at first small in amount and not coherent, later in continuous masses with the character of cholesteatomatous products. Often nothing at all can be seen of the perforation till after the removal of the epithelial masses which have spread into the cavity or even fill it out. Now are these true cholesteatoma? Who ever considers the presence of such epidermoidal products sufficient for the diagnosis will always answer affirmatively, the cautious practitioner will answer only conditionally. Experience gained from post-mortems, and on living subjects when it was necessary to perforate the mastoid, to lay bare the malleo-incudal space and to remove the posterior wall of the auditory canal, show distinctly that many such cases were of real typical cholesteatoma with the path-anatomical characteristics which we consider essential. Cholesteatoma would seem a correct diagnosis, therefore in such cases. But it is not a positive one since in other cases, apparently similar clinically, we find only cholesteatomatous masses which we have described as not true cholesteatoma. In the beginning of the disease, on superficial examination, these cases can hardly be separated clinically; only the progress and further exact observation aid in arriving at a positive diagnosis. Cases with cholesteatomatous products may be cured by symptomatic treatment even if there is caries, provided the latter is not too extensive; while with true cholesteatomata, this is not true, as a rule. On the contrary they often spread in all directions and may, after attacking (corroding) the bones, take the well-known course, *i. e.*, break to the surface, press forward to the brain, invade it, and thus cause the most dangerous diseases which come to the notice of aurists. The typical character, therefore, of the existing disease, the peculiarity of its progress after operation, go to show that the conditions are extraordinary; and that these forms of

temporal and middle ear diseases may not safely be confounded with the common suppurations of the middle ear and the tympanic cavity. Habermann's explanations of this morbid process are not confirmed by clinical observation. It must appear strange that of the great number of middle ear suppurations, only in a small percentage of cases cholesteatoma-like products are found, and the question arises why these cases present such an extension of epidermis elements from the external canal and the drum-membrane and over the mucous membrane of the tympanic cavity into the mastoid process. Clinical observations do not give an answer even if we turn to Bezold's explanation. Tubal catarrh with swelling of the mucous membrane and retraction of the drum-membrane is so frequent and typical that other authors would discover a connection between disease of the tube and cholesteatoma. And many tubal swellings and tubal catarrh occur without cholesteatoma, and how many cholesteatoma without tubal disease! If we consider cholesteatoma in the petrous bone as primary, suppuration in the tympanic cavity as secondary, clinical observations can be accurately explained. The cholesteatoma grows through the most dependent portion of Shrapnell's membrane, causing inflammation in the tympanic cavity and epithelial neoplasms which are continuations of the cholesteatoma. Thus we could also understand why, notwithstanding the presence of cholesteatoma inflammatory irritations may subside and the suppuration cease temporarily. After masses have been shed spontaneously from the surface or been removed artificially by irrigation, the surface becomes temporarily dry and horny, the masses then remain dry without any apparent symptoms, and it is only when the cholesteatoma is again irritated by the invasion of some inflammatory cause, (bacteria, etc.), that new inflammation sets in, which shows itself clinically by pain, renewed secretion, etc.

I do not believe that with this critical review the whole controversy is ended, but I wished to show that there is much left for investigation, and the important examinations of pathological anatomists cannot be gainsaid by superficial clinical observations. And this lack of clearness holds good also in regard to the so-called cholesteatoma of the external meatus and the drum-membrane, of which I shall speak at another time.

A NEW AND MORE CONVENIENT INSTRUMENT THAN THE POLITZER AIR BAG FOR INFLATING THE MIDDLE EAR.

By J. Walter Park, M. D.

LATE CLINICAL ASSISTANT, ROYAL LONDON OPHTHALMIC HOSPITAL, LONDON, ENGLAND; OCULIST AND AURIST FOR THE CUMBERLAND VALLEY TRACTION CO.; SURGEON EYE, EAR, NOSE AND THROAT DEPARTMENT, HARRISBURG HOSPITAL, AND CHILDREN'S INDUSTRIAL HOME, HARRISBURG, PA.

FOR the past two years I have been using in my private practice an instrument for inflating the middle ear, which I claim has for convenience and practical purposes such an advantage over the Politzer air bag, that I have been induced by a number of my friends to give a description of it to the medical profession. It can only be used by those having an air-tank, as will be readily seen by the accompanying cut; nor do I claim it to take the place

of the Eustachian catheter by any means, but as an attachment to an air-tank, for the purpose of inflating the middle ear; it has quite a number of advantages the rubber air bag does not have. Its component parts are as follows: The nose-piece is made of hard rubber with a cone-shaped end to be inserted into the nostril, and on account of its conical shape it will fit any sized nostril. On the other side can be attached a metal tip to fit any automatic cut-off attachment. A curved handle about four and a half inches in length adds to its convenience and utility in fitting the nose and face nicely while in use. Its advantages are these:

1. You can inflate an ear that it is impossible to inflate with a Politzer air bag.

2. You can regulate the air pressure by putting in just as many pounds of pressure as you desire.

3. It fits any sized nose, and requires no pressure on the one side of the nostril to prevent the escape of air during the act of swallowing, or saying the word "hick," and consequently does not cause your patient any pain whatever.

4. You never have any valves leaking, or rubber cracking or breaking. and it is always ready when you want to use it.

5. It is not expensive and lasts a lifetime. Any apparatus for medicating the air can easily be attached. It is manufactured by Mr. E. B. Meyrowitz, of 104 East Twenty-Third street, New York.

32 North Second Street.

OTOLOGY.

ABSTRACTS FROM FOREIGN CURRENT OTOLOGICAL LITERATURE.

By H. A. Alderton, M. D.,
of Brooklyn, N. Y.

UPON DEAF-DUMBNESS.

Szenes, (Budapest), investigated 124 pupils in a deaf and dumb institute. Pathological changes of the hearing organ existed in twenty-two cases ($17^{3}/_{4}\%$), but involved the middle and internal ear in only eight cases, the external ear in the fourteen remaining cases.

The degree of hearing still existing was as follows:

The watch was distinctly heard at the concha in six cases.

Politzer's acoumeter felt by bone conduction in fifty-eight cases; better in twenty-three upon the mastoid process, in fourteen in front of the tragus, and in twenty-one now here now there better.

The air conduction for the tuning forks was completely abolished in eighty-three cases, the remaining forty-one cases not always furnishing trustworthy statements.

The Galton whistle was heard by twenty-two children, five hearing it at a considerable distance—20-60 cm.

Speech was perceived in thirty cases; in eight, vowel hearing was only retained for "a;" in four, sentences could also be heard. In no case was the hearing benefitted by artificial apparatus.

Clapping of the hands was perceived in forty-three cases. In sixteen the hand-clapping was distinctly heard at a distance of eight meters, these children also hearing the Galton whistle well.

S. recommends that even in those cases that can perceive sentences, preference be given the deaf and dumb institutions over the public schools, as places of instruction. (*Sixty-sixth meeting of the German Naturalists and Physicians, at Vienna.*)

FURTHER CONTRIBUTION TO THE CURE-PROMOTING COMPLICATION OF THE ACUTE PURULENT TYMPANIC INFLAMMATION.

Szenes has observed, since a former communication, twenty similar cases, and corroborates his previous findings. The induced otitis media with the well-knowa symptoms takes its usual course, the severe symptoms abating with the appearance of suppuration,

and only the otorrhoea persisting. The latter becomes slightly better under treatment by antiseptics but does not cease until an otitis externa appears, that under treatment is healed in a few days, the otitis media ceasing at the same time. This occurs with such regularity that one cannot think it a matter of chance and must impute to the otitis externa a curative influence in these cases. (*Ibid*).

Malformation of the Auricle.

F. Rohrer, (Zuerich), describes as a unique example a merging of the crura anti-helicis with the crus helicis into a single horizontally running fold. (*Ibid*).

Rubber Protector for the Politzer Nose-Piece.

Hugo Bergeat, (Munich), recommends a nose-piece consisting of a small plate in the shape of a watch-guard, to a perforation in the center of which, on its distal side, a small piece of rubber tubing is attached. The perforation, on its proximal side, fits the conical (catheter) nozzle of the Politzer bag. The use of this little mechanism makes the operation easier, does away with the danger of the operator being sprinkled with secretions, removes the danger of causing injury and bleeding of the nose, and being detachable is easily cleansed and rendered aseptic. (Monat. f. Ohrenh., October, 1894.

CLASSIFIED LIST OF THE CONTRIBUTIONS TO OTOLOGICAL LITERATURE FOR 1894.

COMPILED BY T. MELVILLE HARDIE, B. A., M. D.,
OF CHICAGO.

NOTE—All references to months, numbers, etc., in the list belong to 1894.

1. External auditory meatus.
2. Middle ear, otitis media purulenta.
3. Ossicles.
4. Mastoid.
5. Sinuses, thrombosis following middle ear disease.
6. Abscess of the brain, meningitis, etc.
7. Cholesteatoma.
8. Sclerosis.
9. Tinnitus.
10. Vertigo.
11. Facial nerve.
12. Auditory nerve, labyrinth, semi-circular canals.
13. Deaf-mutism.
14. Examination of the hearing.
15. Associated diseases.
16. Tumors.
17. Therapeutics.
18. New instruments.

I—EXTERNAL AUDITORY MEATUS.

1. Aguanno—Ann. des mal. de l'oreille, etc., August; larvæ.
2. Bacon—Rev. de Laryng., No. 9.
3. Barclay—Med. and Surg. Rep., February 3; fracture.
4. Bezold—Trans. Germ. Otol. Soc.
5. Courtade—Jour. Laryng. Mar.; rupture from muscular effort, persistent hemorrhage.
   Union Med., No. 24; Soc. de Therapeutique, February 4. Treatment of abscess by intubation.
6. Dabney—Med. and Chirurg. Rep., January 20.
7. Haug—Archiv. f. Ohrenheilk, XXXVI, 3; neoplasms.
8. Hermet—Bull. et mem. de la Soc. de Lar., May; eczema.

9. Jansen—Trans. Third reunion Germ. Otol. Soc.; plastic operations in stenosis.
10. Koerner—Ibid; ditto.
11. Kuhn—Ibid; atresia.
12. Ostmann—Monats. f. Ohrenheilk, August, September; production of exostoses.
13. Randall—Trans. Amer. Otol. Soc., VI; anatom. studies.
14. Raoult—Rev. med. de l'Est., February; fly-larvæ.
15. Ray—Amer. Pract. and News, February 27; occlusion.

II—Middle Ear, Otitis Media Purulenta.

1. Bacon—N. Y. Eye and Ear Infirm. Rep., January.
2. Caldwell—N. Y. Med. Jour., September 8.
3. Dahlgren—Univ. Med. Jour., October.
4. Dodd—Chicago Med. Recorder, February; conjugate deviation of eyes.
5. Eitelberg—Wiener Klinik, July, August.
6. af Forselles—Archiv. f. Ohrenheilk, XXXVI, 3.
7. Hartmann—Trans. third reunion Germ. Otol. Soc.
8. Hoffmann—Archiv. f. Ohrenheilk, XXXVI, XXXVII; Section of tensor tympani.
9. Kossel—Charite-Annalen, eighteenth year; in infants.
10. Ledermann—Med. Record, April 14.
11. Marsh—Birmingham Med. Review, February.
12. Stern—Zeitschr. f. Ohrenheilk, XXVI, 1; bacteriology.
13. Szenes—Archiv. f. Ohrenheilk, XXXVII, 3, 4; europhen, etc.
    Jour. of Laryng.
    Annals of Ophth. and Otol., III.
14. Tillaux—Semaine Méd., September 19.
15. Wilson—Trans. Amer. Otol. Soc., VI.

III—Ossicles.

1. Adams—Trans. Amer. Otol. Soc,, VI.
2. Barr—Jour. of Laryng., October; excision of malleus.
3. Barth—Trans. Germ. Otol. Soc.
4. Bezold—Annals of Ophth. and Otol., III, 3.
   Zeitschr. f. Ohrenheilk, XXVI, 1; ankylosis of stapes.
5. Blake—Annals of Ophth. and Otol., III, 331.
6. Dench—Med. Record, June 9.
   Annals of Ophth. and Otol., III, 337.
   Trans. Amer. Otol. Soc., VI; on value of operations.
7. Garnault—Annals of Ophth. and Otol., III, 331.

8. Gellé—Bull. et mem. de la Soc. de Laryng. No. 1; stapes.
9. Gomperz—Annals of Ophth. and Otol., III, 112.
10. Jack—Trans. Amer. Otol. Soc., VI; stapedectomy.
11. Kessel—Trans. third reunion Germ. Otol. Soc.; mobilization and extraction of stapes.
12. Ludewig—Jour. Laryng., June.
    Annals of Ophth. and Otol., III, 329.
13. Milligan—Revue de Laryng., No. 1.
    Jour. of Laryng., October; excision of ossicles.
14. Miot—Semaine Méd., No. 28; mobilization.
15. Randall—Therapeut. Gazette, February.
16. Rohrer—Wien. Med. Wochenschr., No. 1.
17. Stratten—Inaug. thesis Halle.

IV—Mastoid.

1. Allen—Archives of Otol., January, April; Stacke.
2. Blake—Jour. Laryng.
3. Broca—Bull. Méd., October 24; eighty-seven operations.
4. Bronner—Rev. de Laryng., No. 2.
5. Clarke—Lancet, July 14.
6. Cozzolino—Jour. Laryng., June.
7. Eulenstein—Monatschr. f. Ohrenheilk, March; percussion of mastoid.
8. af Forselles—Archiv. f. Ohrenheilk, XXXVI, March; modification of Stacke operation.
9. Gomez—N. Y. Med. Jour., September 1.
10. Grünert—Annals of Ophth. and Otol., III, 109.
11. Knapp—Archives of Otol., January, April; tuberculosis of mastoid.
12. Koerner and Wild—Archives of Otol., January, April; percussion of mastoid.
13. Lange—Archiv. f. Klin. Chirurg., XLVII, 1.
14. Lubet-Barbon—Soc. Franç. d'Otol., May.
    Annals of Ophth. and Otol., III, 332.
15. Luc—Archiv. Internat. de Laryng., No. 3.
16. Macewen—Rev. de Laryng., No. 2.
17. Maurel—Ibid, No. 2.
18. Moos—Archives of Otol., January, April; diagnosis.
19. Robertson—Rev. de Laryng., No. 1.
20. Rosenberg—Deut. Med. Woehenschr., No. 28; prophylactic removal of mastoid.
21. Schleicher—Rev. de Laryng., September 1; Stacke.

22. Schmiegelow—Archives of Otol., January, April.
23. Vulpius—Med. Record, June 16.
    Annals of Ophth. and Otol., III, 337.
24. Walsham—St. Barthol. Hosp. Rep., XXIX.
25. Weissmann—Cong. de la Soc. Franç. de Laryng., May 1.
26. Zaufal—Archiv. f. Ohrenheilk, XXXVII, 1 and 2.
    Prag. Med. Wochenschr., No. 27; actinomycosis.

V—Sinuses, Thrombosis Following Middle Ear Disease.

1. Blake—Trans. Amer. Otol. Soc., VI.
2. Buck—Med. Record, June 30.
    Trans. Amer. Otol. Soc., VI.
    Annals of Ophth. and Otol., III, 338.
3. Crockett—Trans. Amer. Otol. Soc., VI.
4. Grünert—Archiv. f. Ohrenheilk, XXXVI, 1 and 2.
5. Jansen—Archiv. f. Ohrenheilk, XXXVI, 1 and 2.
    Annals of Ophth. and Otol., III, 206; 40 cases.
6. Moos—Zeitschr. f. Ohrenheilk, XXV, 3, 4.
7. Reinhardt—Trans. third reunion Germ. Otol. Soc.

VI—Abscess of the Brain, Meningitis, Etc.

1. Annandale and McBride—Brit. Med. Jour., February 17.
    Edin. Med. Jour., April.
2. Barker—Clin. Jour., February 28; suppuration in lateral sulcus.
3. Broca—Bull. Méd., No. 24.
4. Burnett—Annals of Ophth. and Otol., III, 152.
5. Guye—Trans. Germ. Otol. Soc.
    Zeitschr. f. Ohrenheilk. XXVI; pachymengingitis ext.
6. Hansberg—Trans. third reunion Germ. Otol. Soc.
    Rev. de Laryng., August 1.
7. Jansen—Trans. third reunion Germ. Otol. Soc.
8. Knapp—Archiv. of Otol., No. 3.
    Zeitschr. f. Ohrenheilk, XXVI, 1.
9. Koerner—Trans, third reunion Germ. Otol. Soc.
    Zeitschr. f. Ohrenheilk, XXVI, 1.
10. Moos—Archives of Otol., No. 3.
    Zeitschr. f. Ohrenheilk, XXV, 3, 4.
11. Moure—Archiv. Ital. di Otol., July.
12. Tuffier and Tucker—Bull. de la Soc. Anat. de Paris, March.

VII—Cholesteatoma.

1. Baginsky—Berl. klin. Wochenschr., Nos. 26, 27.
2. Gleason—Med. Bulletin, March.

3. Lichtwitz and Sabrezés—Bull, Med., No. 25.
4. Panse—Archiv. f. Ohrenheilk, XXXVI, 4.
5. Reinhardt—Archiv. f. Orenheilk, XXXVII, 1, 2.
   Annals of Ophth. and Otol., III, 327; treatment by persistent retro-auricular opening.
6. Scheibe—Zeitschr. f. Ohrenheilk, XXVI, 1.

VIII—Sclerosis.

1. Blake—Annals of Ophth. and Otol., III, 330; exploratory tympanotomy treatment.
2. Bosio—Internat. Cong, Rome.
3. Broeckaert—Presse Méd. belge, June 23.
4. Eeman—Rev. de Laryng., September 1.

IX—Tinnitus.

1. Blake—Annals of Ophth. and Otol., III, 331.
2. Gellé—Presse Méd., March 3.
   Tribune Méd., No. 35.
3. Hanel—Inaug. thesis, Jena; influence of tinnitis on production of hallucinations.
4. Kaufman—Monatschr. f. Ohrenheilk, No. 5.
5. Madeuf—Jour. of Laryng., July; auscultation of noises in ear.
6. Mermod—Rev. internat. de Rhinol., etc., No. 6.
7. Peaucellier—Gaz. Méd. de Picardie, No. 5.
8. Seiss—Annals of Ophth. and Otol., III, 64: treatment, chloride of ethyl.

X—Vertigo.

1. Avoledo—Internat. Med. Cong., Rome.
2. Burnett—Trans. Amer. Otol. Soc., VI.
   Med. Age, June 11.
   Annals of Ophth. and Otol., III, 336; treatment by removal of incus.
3. Dalby—Brit. Med. Jour., May 12.
4. Labit—Soc. Franç. d'Otol., etc., April 30.
5. Mackenzie—Brit. Med. Jour., May 5.

XI—Facial Nerve.

1. Briese—Inaug. thesis, Halle.
2. Gellé—Ann. des mal. de l'oreille, No. 1.
   Jour. of Laryng.
3. Hammond—Med. News, May 26.
   Annals of Ophth. and Otol., III, 338; paralysis following operation.

4. Lannois—Gaz. Méd. de Paris, No. 35.
5. Wittstock—Inaug. thesis, Gottingen.

XII—Auditory Nerve, Labyrinth, Semi-circular Canals.

1. Cannieu—Thesis, Bordeaux; Rev. de Laryng., No. 8.
   Ann. des mal. de l'oreille, No. 7.
2. Daae—Archives of Otol., 4; on double hearing.
3. Gradenigo—Archives of Otol., 4; on monaural diplacusis.
4. Herhold—Deut. Med. Wochenschr., No. 14; necrosis of bony labyrinth.
5. Lannois—Semaine Méd., No. 28; on monaural diplacusis.
6. Matte—Fortschritte d. medicin, No. 4.
7. Moos—Internat. Cong., Rome; Jour. of Laryng.; function of semi-circular canals.
8. Politzer—Zeitschr. f. Ohrenheilk, XXV, 3, 4.
   Deut. med. Zeitung, No. 49.
   Archives of Otol., No. 4; primary disease of bony capsule of labyrinth.
9. Prompt—Dauphiné Méd., No. 1.
10. Siebenmann—Zeitschr. f. Ohrenheilk, XXVI, 1; blood vessels of labyrinth.
11. Stein—Study of function of the several parts of labyrinth, Fischer, Jena.

XIII—Deaf-mutism.

1. Benedikt—Berl. klin. Wochenschr., No. 31.
2. Chappet—Lyon Méd., No. 12.
3. Coyne—Archiv. clin. de Bordeaux, No. 4.
4. Delore—Lyon Méd., No. 15.
5. Fink—Vienna; exercises in Deaf and Dumb Institute of Vienna.
6. Giampietro—Ann. des mal. de l'oreille, No. 3.
7. Mygind—Zeitschr. f. Ohrenheilk, XXVI, 1; deaf-mutism, Leipzig, London.
8. Rossi—Boll. delle malatt. dell'orecchio, August; anthropology.
9. Urbantschitsch—Wien. klin. Wochenschr., Nos. 1, 19.
   Annals of Ophth. and Otol., III, 333.

XIV—Examination of the Hearing.

1. Alderton—Archives of Otol. No. 3.
2. Berzold—Ibid.
3. Gellé—Tribune Méd., No. 11.
4. Richter—Archiv. f. Ohrenheilk, XXXVI, 3.
5. Zwaardemaker—Zeitschr. f. Ohrenheilk, XXV, 3, 4.

XV—Associated Diseases.

(*a*) *Dentition.*

Turnbull—Med. and Surg. Rep., March 31.
Annals of Ophth. and Otol., III, 210.
Relation of dentition and diseases of the teeth to diseases of the ear.

(*b*) *Hysterical deafness.*

Cartaz—Semaine Méd., No. 28.
Gradenigo—Archiv. Ital. di Laryng., etc., II, 4.
Ingals—Jour. of Laryng.
Woods—New Orleans Med. and Surg. Jour., September.
Hysterical deafness treated by hypnotism.

(*c*) *Oto-neurasthenia.*

Cozzolino—Jour. of Laryng., June.

(*d*) *Influenza.*

Butler—Canad. Pract., March.
Charlier—Rev. internat. de Rhin., etc., No. 9.
Lemeck—Rev. de Laryng., August 1.

(*e*) *Syphilis.*

Delie—Annals of Ophth. and Otol., III, 209.
Delsaux—Rev. internat. de Rhin., No. 6.
Jour. of Laryng., January.
Gradenigo—Archiv. Ital. di Laryng., etc., II, 4.
Jour. of Laryng, May.
Sclerosis in hereditary syphilis.
Passigli—Boll. delle mal. dell'orecchio, No. 3.
Poli—Internat. Cong., Rome; Jour. of Laryng.

(*f*) *Tuberculosis.*

Knapp—Archiv. of Otol., January, April; tuberculosis of mastoid.

(*g*) *Auricular Reflexes.*

Bonnier—Bull. et mem. de la Soc. de Laryng. de Paris, February.

XVI—Tumors.

1. Cozzolino—Archiv. Ital. di Otol., etc., July; fibroma.
2. Denker—Trans. Germ. Otol. Soc.
   Zeitschr. f. Ohrenheilk, XXVI; carcinoma of meatus, etc.
3. Ferreri—Archiv. Ital, di Otol,, No. 2; epithelioma,
4. Kuhn—Trans. third reunion Germ. Otol. Soc.; myxo-sarcoma.

XVII—Therapeutics.

1. Avelis—All. Wien. med. Zeit,, September 18, 25; errors of general practitioners in treatment of affections of the ear and nose.
2. Cheatham—Amer. Pract. and News, February; quinin.
3. Jirmounski—Wratch. No. 3, Med. Record, March 31. Annals of Ophth. and Otol., III, 212; pilocarpin.
4. Metcalfe—Rev. de Laryng., No. 2; pilocarpin.
5. Plicque—Ann. des mal. de l'oreille, September; electricity in otology.

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5. Dundas Grant—Jour. of Laryng.; magnifying ear speculum; furuncle knife.
6. Lautenbach—Med. News, January 27; double-headed ear screw for foreign bodies.
7. Lewy—Internat. Cong. Rome, Jour. of Laryng.; new acoumeter.
8. Lucae—Berl. klin. Wochenschr., April 16.
9. Todd—N. Y. Med. Jour., May 5; middle ear syringe.

THYROTOMY FOR REMOVAL OF MULTIPLE PAPILLOMA OF THE LARYNX.

By Wendell C. Phillips, M. D.,
OF NEW YORK.

ASSISTANT SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL THROAT DEPARTMENT; INSTRUCTOR IN DISEASES OF THE NOSE AND THROAT IN NEW YORK POST-GRADUATE MEDICAL COLLEGE AND HOSPITAL.

V. N., colored, 11 years of age, came to the throat department of the Manhattan Eye and Ear Hospital June 30, 1893, and gave the following history:

Born in Tennessee; father dead, cause of death unknown; child was in good health until 3 years of age, when mother left her in the South and did not see her for seven years, November, 1892, when she learned that the child had lost her voice; child says voice had been lost for several years. The child had been neglected, had lived a wild out-of-door life, with scarcely any clothing and no shoes and stockings, constantly exposed to the elements.

Diagnosis. Papillomatous growths were found occupying the region of right false cord, extending around to and partly covering left cord. Temp. 100°, pulse 86, but patient is strong and vigorous.

She was admitted to the hospital and given potassium iodid 10 grs. three times a day and local applications. This treatment was continued for three weeks with no improvement. July 29, I removed two or three small pieces with Schrötter's tube forceps and the pathologist's report confirmed the diagnosis.

August 2. Removed two small sections.

November 22. During this interval several pieces were curetted out, with some relief. It was noted that after forceps were introduced she had for several minutes great difficulty of respiration. On two occasions I feared tracheotomy might be necessary. Her tonsils were hypertrophied and were removed to give more room for examination. This plan of treatment was followed, occasionally removing portions until March, and with no permanent improvement. Respiration was comparatively easy except when running or climbing stairs. At this time her condition began to be more serious, and an operation—thyrotomy—was advised and

consented to. Accordingly, on March 30, 1894, she was admitted to the Manhattan Eye and Ear Hospital, and on May 4 a preliminary low tracheotomy was performed under an anesthetic. Alcohol and chloroform being used before ether to prevent struggling and possible asphyxia. She was placed in a room the temperature of which was kept at 75°. There was but little reaction and she slept well all night. Her temperature for the first week did not reach 100°. She was kept on special diet—milk, soups, etc.—and she did not cough except when tube was cleansed. As is usual, the growths reduced considerably in size as a result of the tracheotomy. On April 20, sixteen days after the tracheotomy, I performed the operation of thyrotomy, ether being administered through a rubber funnel attached to a long piece of tubing which was inserted into the tracheotomy canula. The shoulders were elevated, leaving the head hanging well down. A long incision was made down to and exposing the entire thyroid cartilage, crico-thyroid membrane and the cricoid cartilage. With a probe-pointed curved scissors the probe blade was plunged through the crico-thyroid membrane and the entire body of the thyroid cartilage divided through to the notch. The hemorrhage was considerable for a moment, but entirely subsided. Small French sponges were passed downwards into the trachea and no trouble was experienced from blood passing downwards.

When the segments of the thyroid were held apart by retractors, the masses of papillomatæ protruded from the wound. They were very numerous and were found to be attached not only to the vocal cords, but to the entire subglottic region, and also to the ventricles.

The growths were removed mostly with a curette, a few being removed by the cutting forceps and scissors.

The whole surface was thoroughly curetted and thoroughly cauterized with the galvano-cautery. After hemorrhage had been controlled the cartilage was closed by four stitches of the largest catgut, and the external wound entirely closed with silk.

It is scarcely necessary to say that the operation was performed under strict antiseptic precautions.

She was again placed in a room with constant temperature at 75°. Diet special, milk and bran water. She was very restless all night and slept but little; no pain.

At 9 p. m. the temperature began to rise and by 3 o'clock a. m. of the 21st it had reached $105^{6}/_{8}°$ and pulse 136, resp. 32. Phenacetin and cafferin were given and by 6 a. m. temperature was 103°. (Accompanying charts give temperature range).

For the next four days temperature ranged from $104\frac{1}{2}^{\circ}$ gradually down to normal. Pulse was exceedingly weak and irregular, and $\frac{1}{130}$ grs. strych. was administered hypodermatically every three hours. On the 22d she complained for the only time during the treatment of slight pain in the throat. On this day the pulse reached 140°. The inner tube was cleansed when necessary. The discharge through the tracheotomy tube increased for a few days after operation, but at no time has she had any symptoms of any extension to the bronchial tubes or lungs; she took nourishment well and could breathe freely by mouth even when tube was closed.

On the 24th the dressing was changed and found to be healed in the upper part, but two or three of the lower stitches were separated; cleansed and packed with iodoform gauze.

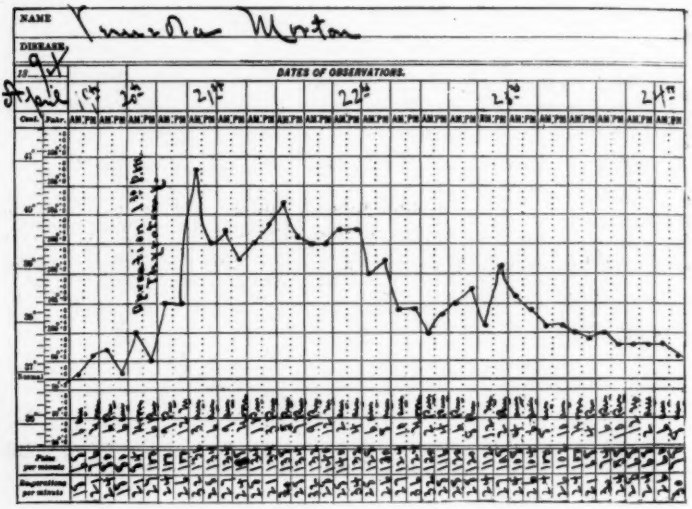
The lower part of the wound has gradually healed by granulations, and but a small sinus now remains.

Her voice, entirely lost before operation, has improved slightly. No hope of return of phonation was given previous to operation, and the vocal cords were found to be badly damaged by the long continued pressure of the papillomata.

Examination with mirror May 21st, one month after operation: Entire larynx is still somewhat congested but appears to be clear, and no sign of recurrence or of stenosis from adhesions.

It is interesting to note that previous to operation the case was diagnosed as multiple papilloma of the vocal cords while the operation proved it to cover so large a surface, and that no endolaryngeal procedure would have been successful in her case.

July 15th. Examination to-day reveals no recurrence. Phonation is much improved, but no natural tone can be produced, it being forced and hoarse.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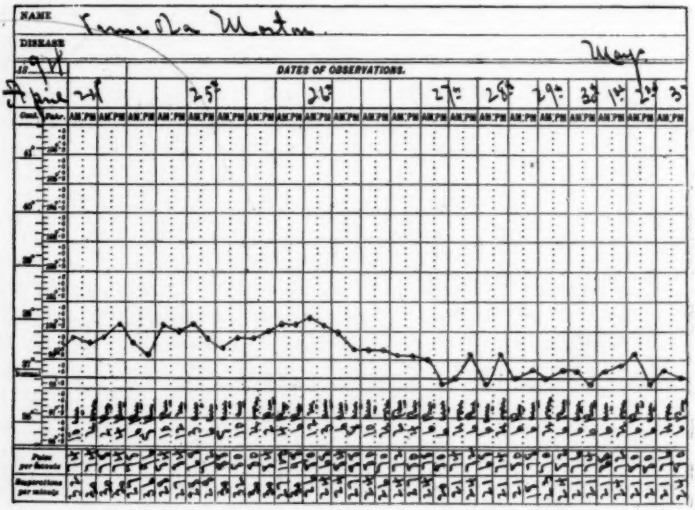
Temp.
Pulse per minute
Respirations per minute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Pulse per minute
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THE NASAL TREPHINE IN HYPERTROPHY OF THE INFERIOR TURBINATED BODY.

By G. Melville Black, M. D.,
of Denver, Colo.

Professor of Rhinology and Laryngology in the Colorado School of Medicine; ex-House Surgeon Manhattan Eye and Ear Hospital, New York.

IN advocating this method of treatment, it is not my intention to condemn other well known and well tried procedures, such as the galvano-cautery, the snare, and chemical caustics. Each have their places in the treatment of hypertrophic rhinitis. In any surgical procedure in the nose the object in view should be to remedy the defect with as little damage to the part as possible, whereby its function may be preserved. It is my desire to bring to your attention in the use of the Nasal Trephine an instrument which, in skillful hands, brings about more reduction in the size of the turbinated body, with less damage to the part, than any other operation I know of.

The Nasal Trephine as sold by most instrument makers is from $^3/_4$ to $1^1/_4$ inches in length, is attached to a steel stem which

fits into a dental hand-piece and is run by a dental engine or an electro-motor. If the turbinated body is universally hypertrophied, the trephine is placed against the anterior and inferior portion of it, as indicated by the dotted lines in the drawing, and a semicircular or circular piece of tissue removed from the entire length of the body. If the hypertrophy is confined to a portion of the turbinated body only, the trephining is limited to that portion.

I have found that the trephines spoken of above were so short, that before one-half of the hypertrophied surface was trephined through, the trephine would be plugged full of hypertrophied tissue, necessitating the withdrawal of the instrument and removal of the tissue therein. This was found to be very inconvenient, inasmuch as the hemorrhage, which followed the withdrawal of the instrument, so disguised the part as to render it difficult to reintroduce the trephine in the same place. I therefore had Mr.

E. B. Meyrowitz, of New York, make for me a set of trephines $2^1/_2$ inches long. This drawing shows the largest instrument in its actual size:

The three rings in accompanying drawing indicate the size of their calibers. With this instrument the objection which I found to the usual trephines in use is overcome, it being sufficiently long to trephine from one end of the turbinated body to the other without its becoming plugged with tissue. The advantages of the operation over the cautery and acids are:

1. The clean cut surfaces of the semicircular opening made at the inferior portion of the turbinated body, fall together and heal by first intention, thereby at once restoring free nasal respiration.

2. There is no secretion to speak of after the first twenty-four hours.

3. There is no perceptible cicatrix. The surface of the turbinated body is of normal shape.

4. It is extremely rare that more than one operation is required.

5. There is no danger of adhesion of the turbinated body to the septum.

The only objection that I can see to this operation is that hemorrhage is quite free for a few moments, and that some oozing continues for several hours; however, I have never found the hemorrhage alarming or even annoying.

I have used the trephine in hypertrophy of the inferior turbinated body for the past three years with universal success. I began its use in cases of true hypertrophy only where it was especially indicated, but of late have been gratified to find that it has proved of great value in cases of engorgement which were not benefited by the usual cleansing and astringent applications. Some of these cases of engorgement are very hard to manage. Even the galvano-cautery fails to produce anything more than transient benefit. It is disagreeable to find it necessary to cauterize every few months, as eventually we have almost a functionless turbinated body from such extensive destruction of tissue. With the smallest size trephine, the turbinated body is penetrated from end to end just beneath the mucous membrane, thereby a portion of the vascular plexus is destroyed. The immediate result being more or less swelling of

the turbinated body from extravasation of blood, which lasts about four or five days when the body begins rapidly to reduce in size, until at the end of two weeks from the time of the operation it is of normal size and appearance. In a few instances it has been necessary to repeat the procedure, but as a rule one operation is sufficient. In these cases of engorgement it is well to operate upon one side at a time, not proceeding with the other until the swelling has subsided.

I cannot recommend the operation for hypertrophy of the middle turbinated body, inasmuch as, owing to the position of this body, it is next to impossible, in the majority of instances, to do anything more than trephine directly into the body from below, upwards. The snare and cautery are much more efficacious in this region.

PROFESSIONAL NEWS.

Dr. Henry A. Alderton, of Brooklyn, N. Y., whose ability is excelled only by his energy, and will to work, has consented to assist in gleaning from the current otological literature of the world all that is practical and useful for the readers of the ANNALS.

Dr. G. W. Grove, formerly assistant surgeon in the Eye Department of the New York Nose and Throat Hospital, and the O. D. P. Bellevue Medical College Hospital, has removed from New York to Kansas City, Mo.

Dr. W. H. Wakefield has removed from Winston, N. C., to Charlotte, N. C.

The Kansas City, (Mo.) Academy of Medicine spread its Fifth Annual Banquet at the Midland Hotel on Tuesday evening, January 8th. The Academy is doing the best work of any society west of Philadelphia, and has in its library the largest collection of recent "up to-date" medical books west of New York.

Dr. T. Melville Hardie, of our editorial staff, was quietly married on the evening of December 17th, to the only daughter of Judge Gwynn Garnett, of Chicago. After their wedding tour Dr. and Mrs. Hardie will reside at 3604 Grand Boulevard. The ANNALS wishes them all happiness in the coming years.

FOR SALE.

THE PRACTICE OF AN OCULIST AND AURIST.

This practice has been in existence eleven years, and produces about $14,000 in cash. Splendid central location, fine offices, long lease, name and address of patients for eleven years to whom notices may be sent; will thoroughly introduce purchaser; college, hospital and railroad appointments a possibility to the right man; best reasons for selling; beautiful city of 200,000 inhabitants. This is one of the rarest opportunities and will be sold for $7,000 *cash*. Do not apply unless you mean business. Address B, care Dr. Jas. P. Parker, Union Trust Building, 701 Olive Street, Saint Louis, Mo.

BOOK NOTICES.

A PRACTICAL SYSTEM OF SELF-INSTRUCTION IN THE GERMAN LANGUAGE FOR PHYSICIANS AND MEDICAL STUDENTS. BY ALBERT PICK, M. D. PUBLISHED AND FOR SALE BY EDWARD S. TANNER, NEWTONVILLE, MASS., IN TWELVE PARTS AT FIFTY CENTS PER PART OR SIX DOLLARS FOR THE COMPLETE WORK.

As the title of this work implies it is intended for self-instruction and will enable physicians to learn to read German medical literature and converse with German patients in their tongue. The instruction is imparted by means of a series of short essays on medical subjects in German with interlinear translation and pronunciation. Each lesson is supplemented by a number of elementary phrases used in conversation, and by some brief but sufficient remarks on grammar. It is well adapted for the purpose of imparting a knowledge of medical German and will surely "fill a long felt want" if the hungry doctor, for medical science, will study it carefully and learn to curry favor with wealthy German patients.

A BOOK FOR TRIAL-LENSES. Of all the books that I have been called upon to review this is the most original. When closed it has the appearance of a substantially bound volume about the size of Gould's excellent New Illustrated Dictionary of Medicine. It opens at the middle and presents to view, in racks, a complete set of Nachet's trial-lenses, trial-frames, etc.

The only two leaves in the book are of heavy board and are intended to hold the lenses in place while it is closed, and these leaves have Snellen's test-letters on them and can be removed from the book and hung on the wall, or elsewhere, and used for testing patient's vision. The book (case for trial-lenses) fits a "dictionary holder" which allows it to be raised or lowered to any height and "fixed" on an incline of any desired angle.

The portability and convenience of this simple ingenious case and holder for test-lenses commends it to those who work at refraction four to six hours each day, as it holds the lenses so near and convenient that stooping and fatigue are avoided. The author (inventor) of the book has no "copyright" and he desires no advertising as he is a busy blank-book manufacturer who has all

the business he wants. The idea came to him while watching me test his little daughter's eyes, and he had the book (case) made and presented it to me. Any ophthalmologist can have a good book-binder dissect an old worn-out Nachet case and get the leather strips bearing the numbers of the lenses and the racks, and have the book made at small expense, and the "dictionary holder" can be obtained at any stationery store. J. P. P.

ONE HUNDRED YEARS OF BUSINESS LIFE. BY MESSRS. W. H. SCHIEFFELIN & CO., OF NEW YORK CITY. A GREETING TO THEIR FRIENDS, IN THE FORM OF A PAMPHLET SETTING FORTH THE HISTORICAL AS WELL AS COMMERCIAL SIGNIFICANCE OF THE COMPLETION OF A CENTURY OF EXISTANCE OF THE HOUSE OF W. H. SCHIEFFELIN & CO.

The fine "hand-made" Holland paper, handsome engravings, and elegant printing of this beautiful pamphlet cannot fail to excite admiration. It is absolutely the most beautiful pamphlet ever produced in America, or any other country.

It is in keeping with the high grade of drugs and pharmaceutical preparations that are supplied by W. H. Schieffelin & Co., who *do all* they undertake *well*. The writer was brought up by one of the most thorough, careful, and conscientious pharmacists who ever conducted a pharmacy, and every pound of opium and cinchona bark that entered the establishment had to be assayed before it was placed "in stock," and it was the writer's business, for seventeen years, to make the assays and estimate the value of the drugs, and during all of those years no error was detected in the assay of a package, bearing the assay on the label, of Schieffelin & Co., though it would have been a great pleasure to have detected an error, as there was a standing prize for the detection of an error in an assay of their laboratory.

[As one who was brought up under the old regime, I cannot refrain from saying in this connection that the modern craze of physicians to be their own pharmacists and dispense tablets and preparations that they are unable to determine the contents of, will do scientific therapeutics more harm than homeopathy. It appears that physicians who feel "called" to fight scientific pharmacy do not see that the more intelligent and best trained pharmacists will soon be compelled to qualify as physicians, because a pharmacist cannot live without the support of physicians, and no well trained pharmacist will submit to being placed on a level with a common merchant. Pharmacists make the best physicians and surgeons, and

it requires but little effort for a well trained pharmacist to make a doctor, and he will enter the medical college with a full knowledge of materia medica, therapeutics, chemistry and pharmacology, so that "medicine" will come easy to him. His hands have been trained to handle small packages, small weights and *very small* amounts of money, which develops good use of his hands and enables him to excel other men in operative surgery.]

To return to the pamphlet of W. H. Schieffelin & Co., we find it divided into six chapters, giving six changes in the composition and name of the firm and periods of development of American commerce. The story is well presented and is very interesting. The pamphlet contains fifty-six pages, with an appendix, giving a complete history of "One Hundred Years of Chemistry and Pharmacy," all of which must be read to be appreciated.

J. P. P.

MISCELLANEOUS.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

The College of Physicians of Philadelphia announces that the next award of the Alverenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about $180. will be made on July 14, 1895, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published, and must be received by the secretary of the college on or before May 1, 1895.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within it the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the college; other essays will be returned upon appplication within three months after the award.

The Alvarenga prize for 1894 was awarded to Dr. G. E. de Schweinitz, of Philadelphia, for his essay on Toxic Amblyopias.

Essays, in competition for the next award, should be sent to the secretary of the college, Dr. C. W. Dulles.

HYDROGEN DIOXIDE. $H_2 O_2$.

By Dr. L. D. KASTENBINE, A. M., M. D., Professor of Chemistry, Urinology, and Medical Jurisprudence, Louisville Medical College, Professor of Chemistry Louisville College of Pharmacy. This remarkable liquid which contains the greatest percentage of oxygen of any compound known, was for sometime considered as a mere solution of oxygen in water, and consequently was called oxygenated water. It was afterward obtained free from water and found to be a definate chemical compound of hydrogen and oxygen, and differing from water in containing twice as much oxygen. It has a somewhat bitter, astringent taste, and is color-

less, transparent and without odor. It contains 94 per cent of oxygen gas by weight, and will yield 475 times its volume of that gas.

A fifteen volume solution is one that will give off fifteen volumes of gas from one volume of the solution A ten volume solution will yeld ten pints of oxygen gas from one pint of the solution, and so on.

These solutions, although more stable than mere concentrated preparations, nevertheless decompose and lose their nascent oxygen on which its powerful antiseptic powers depend, and consequently we find the commercial brands varying considerably from their reputed strengths. Of the various brands of commercial dioxides I have examined, I find Marchand's to be the one which yields the largest amount of available oxygen under all conditions of exposure, and the one which contains the minimum percentage of free acid. All the marketable articles I have seen are free from barium compounds, but the majority do not come up to the 15 volume standard, but are 6, 8, 10 and 12 volume solutions.

NOTICE.

A CALENDAR for 1895 upon receipt of request. P. Blakiston, Son & Co., Medical Booksellers, 1012 Walnut street, Philadelphia, will send free by mail, postage prepaid, a neat desk calendar for 1895.

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VOLUME IV. JANUARY, 1895. No. 1.

ANNALS OF OPHTHALMOLOGY AND OTOLOGY

PUBLISHED QUARTERLY

BY JAS. P. PARKER, M. D.

701 OLIVE STREET, SAINT LOUIS, MO.

Subscription Price, per annum, $5.00; Single copies, $1.50.

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